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THE LANCET

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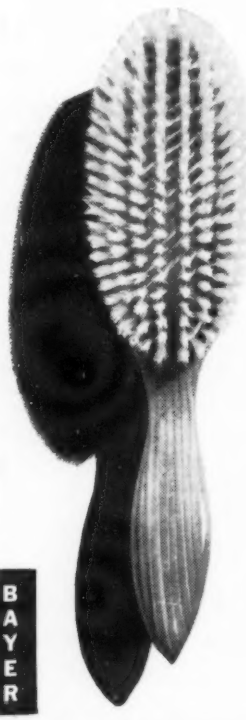

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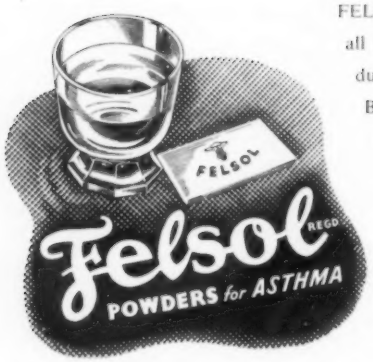

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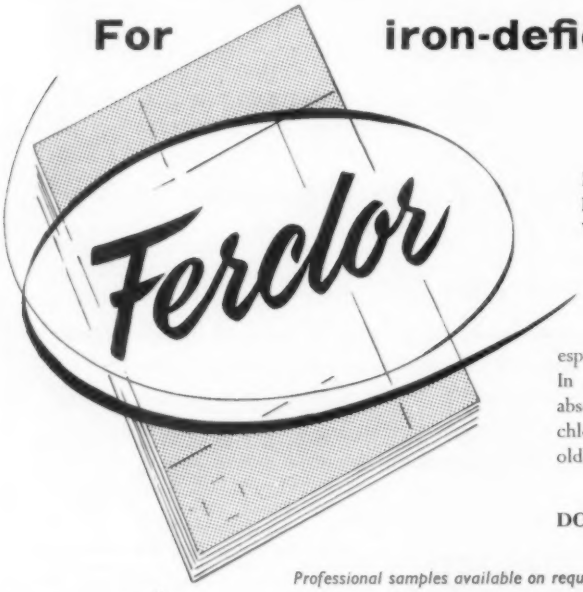

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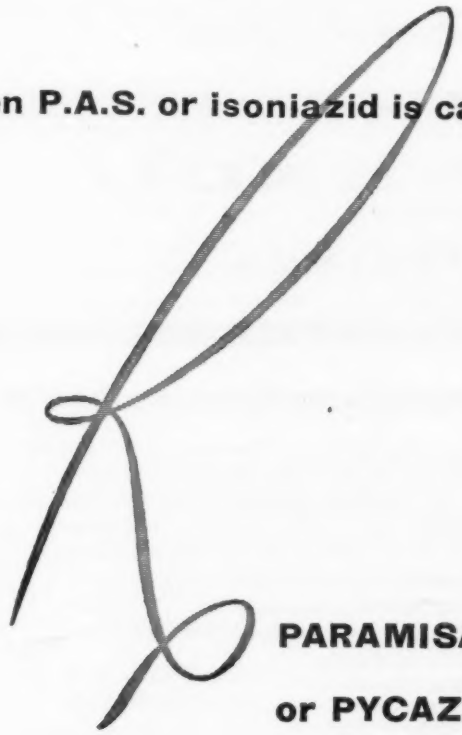

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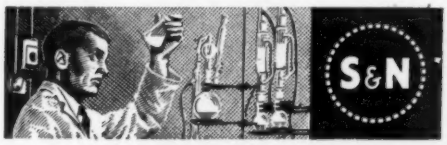

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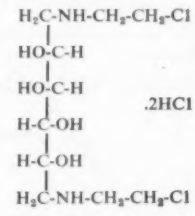

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* *Brit. J. Tuberc.*, 1958, 52, 19
Lancet, 1958, 1, 746

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Transvasin not only induces vasodilation of the skin with a superficial erythema, but also brings about a deep hyperaemia of the underlying tissues. It is non-irritant and can be safely used on delicate skins.

It is now being widely prescribed, with successful clinical results. Since a very small quantity is sufficient for each application, the cost of treatment is extremely low.

**Therapeutische Umschau 1952, 8, 143.*

Tetrahydrofurfuryl salicylate	*14%*
Ethyl nicotinate	*2%*
n-Hexyl nicotinate	*2%*
Ethyl p-aminobenzoate	*2%*
Water-miscible cream base ad	*100%*

Transvasin is available in 1 oz. tubes, basic N.H.S. price in the U.K. 2/6 plus P.T., and is not advertised to the public. It may be prescribed on Form E.C.10. Samples and literature will be gladly sent on application

LLOYD-HAMOL LTD

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Transvasin is the registered trade mark of Lloyd-Hamol Ltd.

An Oral treatment for Piles?

why the long way round?

At first sight the oral route seems an unnecessarily long approach to a pile, but it has obvious aesthetic and hygienic advantages and it avoids the pain of inserting a suppository against an inflamed pile.

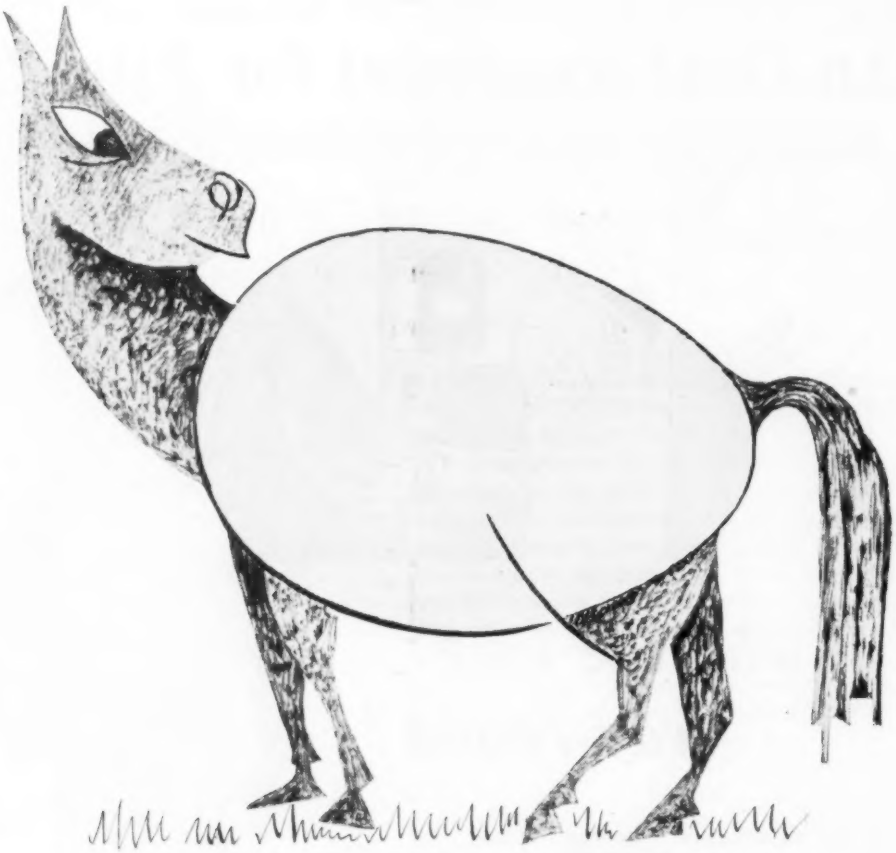
Cetaceum—the active ingredient in Parmacetyl tablets—passes down the gut unchanged except that it becomes 'tacky' at body temperature. It has a demulcent effect when it arrives at the rectum and anal canal. One course of these tablets will remove pain and check bleeding in most attacks of 'acute piles' without masking any more serious underlying pathology.

* *The results of a successful clinical trial with Parmacetyl tablets were published in the February 1957 number of the Practitioner. A summary of this paper is available on request.*

PARMACETYL *Tablets*

Parmacetyl is prescribable on form E.C.10. Basic N.H.S. price 2s. 1d. Dosage is on every tube of 12 tablets. For information and sample, please write to manufacturers.

E.G.H. LABORATORIES LTD.
PERU ST., SALFORD 3, LANCS.



HORSES *or* EGGS *can cause*

(and many other things)

allergic asthma & rhinitis.

'DELTASTAB' or 'DELTA-FENOX'

(Prednisolone) *(Prednisolone Nasal Spray)*

provide prompt relief.

Detailed literature gladly sent on request

BOOTS PURE DRUG CO. LTD. · NOTTINGHAM · ENGLAND

Lederle's new superior corticosteroid created to minimize the major deterrents to all previous steroid therapy

Ledercort*

TRIAMCINOLONE (9 alpha-fluoro-16 alpha-hydroxyprednisolone)

LEDERCORT triamcinolone shows great promise as the agent of choice for all diseases ordinarily held to be improved by corticosteroids.
It offers increased potency for greater clinical effectiveness, and fewer side effects.
In allergic disorders and dermatoses, LEDERCORT triamcinolone dosage averages one-half that of prednisolone. It provides prolonged therapy at less cost, with easier patient management.

INDICATIONS

Rheumatoid arthritis; bronchial asthma; dermatoses; allergic disorders; other conditions amenable to therapy with corticosteroids.
Oral tablets of 4 mg., scored for easy division.
Bottles of 30 and 100.

* REGD. TRADEMARK

Lederle LEDERLE LABORATORIES DIVISION

Cyanamid OF GREAT BRITAIN LTD., London, W.C.2

Iron
your patients
can tolerate...
Rarical
TRADE MARK
iron-calcium tablets
a unique new compound—
iron plus calcium in a single molecule
TOLERATED no stomach upset, constipation or diarrhoea
phosphate-free — no leg cramps
EFFECTIVE more haemoglobin in less time
EASY TO TAKE white, uncoated, tasteless tablets may be swallowed, chewed, or crushed and suspended in fluids
Each tablet contains: iron: 25mg. calcium: 85mg.
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100 tablets
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IRON-CALCIUM TABLETS
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Better relief for arthritics—minimum side effects

In salicylate therapy BUFFERIN (Antacid Analgesic) has these two special advantages. It is *faster-acting* — twice as fast as ordinary aspirin. It is *better tolerated* — even in large doses, as for arthritis.

According to a British survey, as many as 42% of arthritics are intolerant to aspirin. And in a blind trial among arthritics with a *proved* intolerance to aspirin, 70% had no gastric symptoms after taking large doses of BUFFERIN over periods of 4 to 16 months. (1).

In clinical tests, it was shown that BUFFERIN raises the salicylate blood level of humans more than 20% higher in *ten* minutes than ordinary aspirin does in *twenty* minutes.

Hence the importance of BUFFERIN in all salicylate therapy. Only BUFFERIN contains the antacid agents which :—

* reduce gastric upset to a negligible minimum (2), (3);
* actually speed the pain-relieving ingredient into the blood-stream (4), (5).

IT ACTS FASTER. IT IS BETTER TOLERATED. IT CONTAINS NO SODIUM.

1 (*Bufferin in the Management of Rheumatoid Arthritis, J.A.M.A. 158:386 (June 4) 1955.*)

2 (*The Neutralization of Gastric Acidity with Basic Aluminium Aminoacetate, J. Pharmacol. and Expera Therap. 82:247 (Nov.) 1944.*)

3 (*In Vitro Differences Between Dihydroxy Aluminium Aminoacetate and Dried Aluminium Hydroxide Gel, J. Am. Pharm. Assoc., Sc. Ed. 41:361 (July) 1952.*)

4 (*Effect of Buffering Agents on Absorption of Acetylsalicylic Acid, J. Am. Pharm. Assoc., Sc. Ed. 39:21 (Jan.) 1950.*)

5 (*The Pharmacologic Principles of Medical Practice, ed. 3, Balto., The Williams & Wilkins Company, 1954, p. 593.*)

Formula: Acetylsalicylic Acid 5 gr: Aluminium Glycinate ¾ gr: Magnesium Carbonate 1½ gr.

BUFFERIN HAS NO EQUIVALENT IN THE B.P. OR NATIONAL FORMULARY.

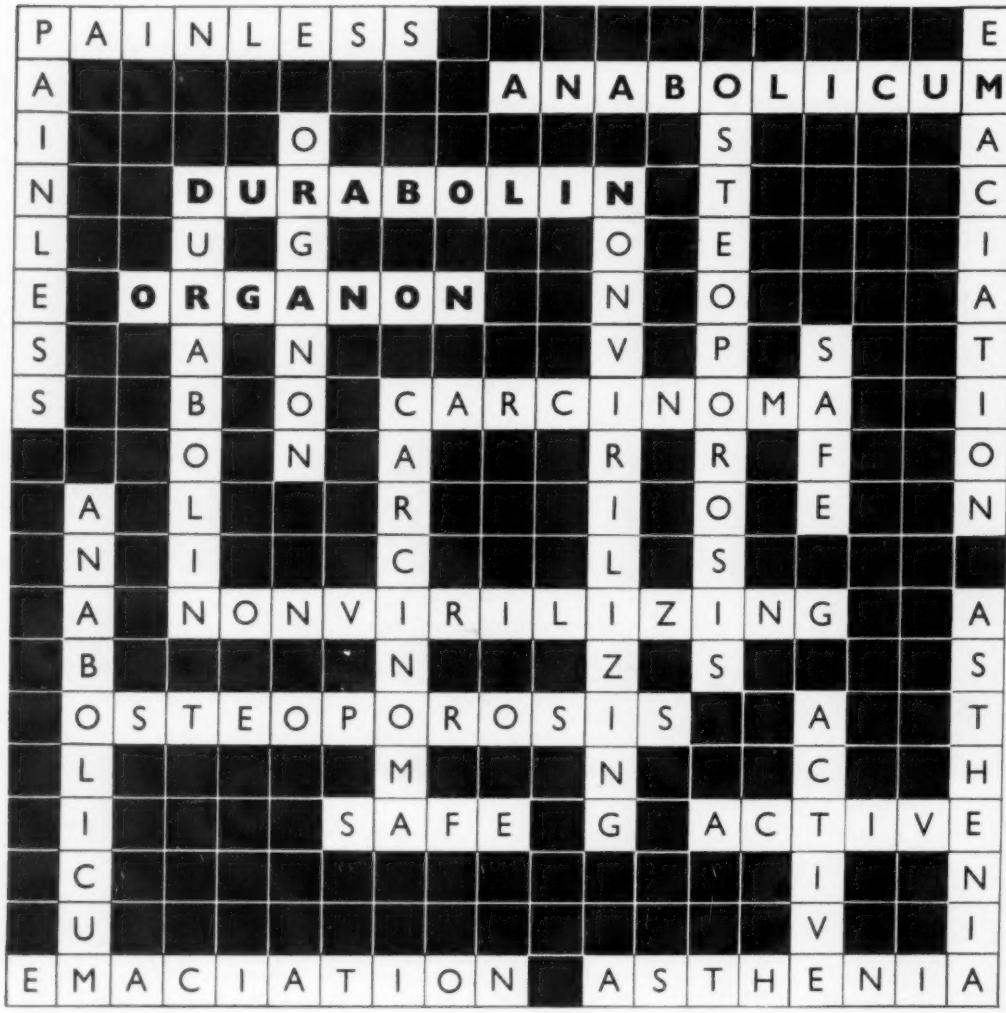
BUFFERIN

is the trade mark of the Bristol-Myers Co. Ltd., London and New York.

Sole distributors in U.K.: J. C. Gambles & Co. Ltd., 209-215 Blackfriars Road, London, S.E.1.

Bufferin is now available in the Irish Republic—sole distributors: Messrs. Fasset & Johnson (Ireland) Ltd., 6-7 Crow Street, Dublin.

Please write for free samples to: BRISTOL-MYERS COMPANY LTD., 209-215 BLACKFRIARS ROAD, LONDON, S.E.1.



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DURABOLIN

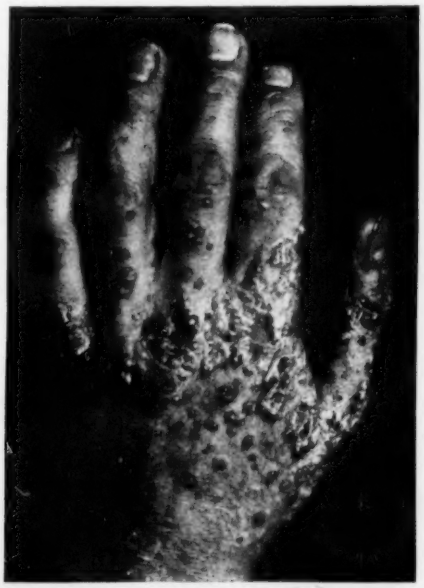
(NOR-ANDROSTENOLONE PHENYL PROPIONATE)

the most powerful tissue-builder

One 25 mg. injection weekly

In the Treatment of certain

SKIN DISEASES



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HP* ACTHAR *Gel*

*The Armour Laboratories brand of HIGHLY PURIFIED long-acting Corticotrophin (ACTH) (in Gelatin)

HP* ACTHAR Gel is a highly purified ACTH of high potency in gelatin with rapid action and prolonged effect by subcutaneous or intramuscular injection.

Available in 5 ml. vials (20 and 40 I.U. per ml.). Stable at room temperature for two years.

ACTHAR is also available in the form of Lyophilized Powder for Intramuscular injection in vials containing 10, 25 and 40 I.U. per vial, and for intravenous infusion in vials containing 30 and 75 I.U. per vial.

HP* ACTHAR Gel affords a ready and efficient means for improvement in the treatment of

Psoriasis

Pemphigus

Pruritis

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Available to Hospitals only.

Fully documented literature will be gladly supplied on request.

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Summer has set in with its usual severity . . .

(Coleridge 1826)

At this time of the year airborne pollen brings acute discomfort to many people.
Pabracort Insufflations have proved their value in the treatment of Hay Fever by clinical trial and in general practice. Dramatic relief is usually obtained within two or three days and complete alleviation after two weeks' treatment.

Reference: *Lancet (1956) i.,537.*
Lancet (1955) i.,234.
Proc. S.M. Mayo Clinic.
Vol. 32 No. 22, 30, 10, 1957.

FORMULA *Each insufflation capsule contains 15 mg. hydrocortisone acetate in a specially prepared snuff base.*

PACKINGS *Pabracort outfit (10 capsules and insufflator)*
Capsules: 10, 25, 100.

PABRACORT

INSUFFLATIONS

PAINES & BYRNE LTD., PABYRN LABORATORIES, GREENFORD, MIDDX.

An inspired association

Kemicetine Succinate

Streptomycin dihydrostrept.

The high solubility of **Kemicetine Succinate** in water has made it possible to manufacture a preparation associating chloramphenicol with streptomycin, which can be administered parenterally. In Strepto - Kemicetine, the two antibiotics exert a most valuable complementary effect as well as one of simultaneous potentiation, thus producing extremely good results, particularly in pertussis, brucellosis, staphylococcal infections, tubercular empyema and infections of the urinary system.

STREPTO-KEMICETINE

The first injectable association of chloramphenicol and streptomycin.

CARLO ERBA MILANO.

Both these patients have **Hay Fever...**

but one does best on

Ambodryl

HIGH-POTENCY ANTIHISTAMINE WITH MINIMAL SIDE-EFFECTS

AMBODRYL* (Bromo-diphenhydramine hydrochloride, Parke-Davis) is supplied in capsules of 25 mg. or as AMBODRYL ELIXIR containing 10 mg. in each teaspoonful.
Average adult dose :
25 mg. three or four times a day.

* *Trade Mark*

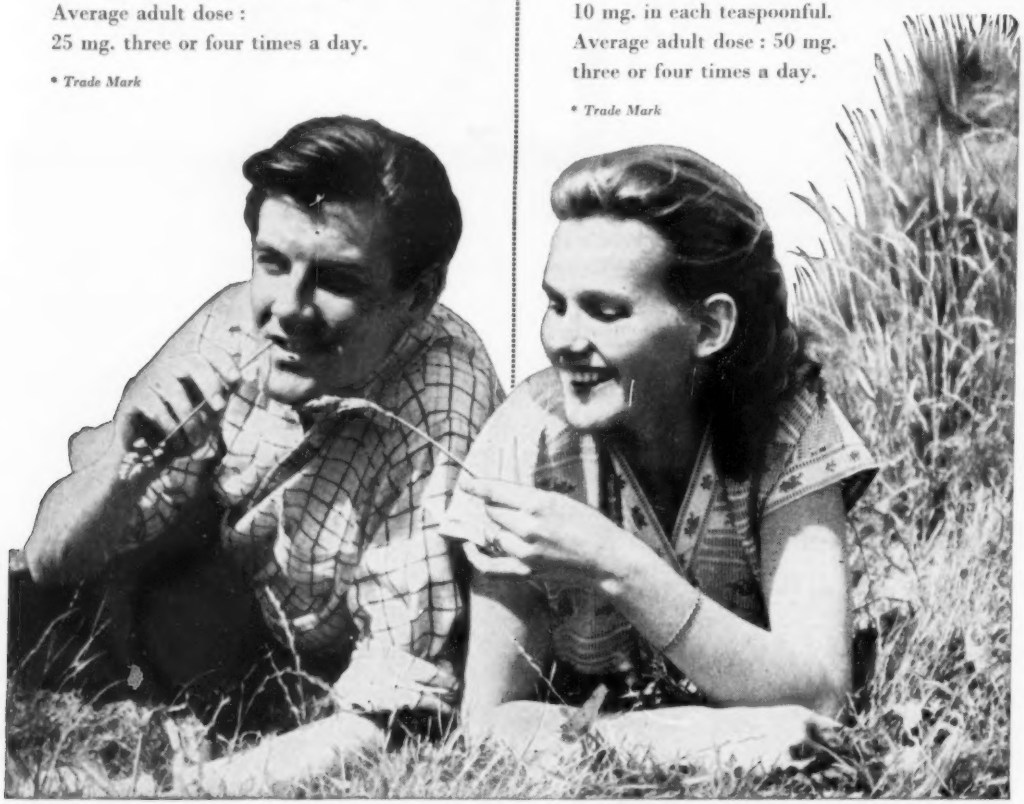
while the other responds best to

Benadryl

COMBINED ANTIHISTAMINE AND ANTIACETYLCHOLINE ACTION

BENADRYL* (Diphenhydramine hydrochloride, B.P.C., Parke-Davis) is supplied in capsules of 25 mg. and 50 mg. or as BENADRYL ELIXIR containing 10 mg. in each teaspoonful.
Average adult dose : 50 mg. three or four times a day.

* *Trade Mark*



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BY **SANDOZ**

25 mg. thenalidine tartrate
0.579 g. calcium lactate
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anti-allergic, anti-pruritic

The effervescent anti-allergic drink

Samples upon request

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For the patient who just doesn't get well

PROMOTING

—a return of appetite

—an increase in weight

—a sense of well-being

with Anabolex, the protein-anabolizing, non-virilizing steroid

PATIENTS who are run down or who are recovering from illness frequently suffer from faulty protein metabolism. They are in negative nitrogen balance. Protein, in effect, is being broken down and lost faster than it is being built up.

Anabolex (androstanolone) restores the physiological balance. Many clinical trials have shown that, following the administration of Anabolex, there is an immediate return of the body's capacity to build up protein. The patient feels better, eats better and gains weight.

Here, then, is a physiological "tonic" with a wide therapeutic range. The weakness, lassitude, lack of energy and interest associated with many pathological states may be rapidly overcome by the administration of Anabolex.

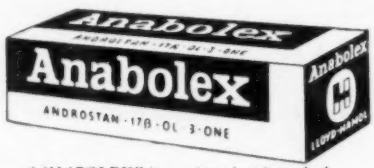
Anabolex can be safely given to patients of all ages and both sexes; in therapeutic doses, its virilizing properties are almost negligible. The only known contra-indication is prostatic carcinoma.

INDICATIONS:

Middle-aged or elderly people who are debilitated or "run down."

Preparation for and recovery from planned surgery. Convalescent patients. Premature infants. The child or adolescent who is under weight. Anorexia. Asthenia. Malnutrition. Wasting diseases.

PRESENTATION: In vials of 25 and 100 tablets, each tablet containing 25 mg. Androstanolone. Anabolex can be prescribed on Form E.C. 10. Basic N.H.S. price 20/- and 70/-.



"ANABOLEX" is a registered trade mark of
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ENAVID*

BRAND OF NORETHYNODREL AND ETHYNYLOESTRADIOL 3-METHYL ETHER

For the specific control of menstrual irregularities

ENAVID, containing the new Searle steroid norethynodrel, permits *specific* and usually complete *control* of the menstrual cycle on *oral* administration and thus provides effective therapy for most menstrual irregularities.

ENAVID has strong progestational and a lesser oestrogenic activity on the endometrium, which stimulates its development to a secretory phase. It also inhibits the secretion of gonadotropins by the anterior pituitary gland.

ENAVID is therefore recommended for:

- **AMENORRHOEA** (Primary and Secondary)
- **OLIGOMENORRHOEA**
- **MENORRHAGIA**
- **METRORRHAGIA**
- **DYSMENORRHOEA**
- **PREMENSTRUAL TENSION** and the
- **"INADEQUATE LUTEAL PHASE"**

ENAVID is supplied as 10 mg. tablets in bottles of 20 and 50 tablets.

Detailed literature is available on request.

* *Trade Mark.*

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G. D. SEARLE & CO., LTD., HIGH WYCOMBE, BUCKS. Tel. High Wycombe 1770

EN : PI17

NULACIN

provides milk-alkali drip therapy without a tube

Maintains continuous control of gastric acidity

Until a few years ago, maintained continuous control of gastric acidity was impossible without hospitalization and discomfort to the patient.

Then a unique treatment in the form of Nulacin tablets was evolved to achieve this desirable state—simply, effectively and without attendant disadvantages. In the ensuing period Nulacin therapy has been amply tried and proved by numerous clinical studies and by therapeutic use in many countries.

A Nulacin tablet placed in the mouth between the cheek and the gum dissolves slowly and releases its contained medicaments at a rate that gives continuous neutralization of the acid gastric juice. Nulacin accomplishes this without any danger of causing alkalosis or other side-effects. The results are comparable with those of intragastric milk-alkali drip therapy.

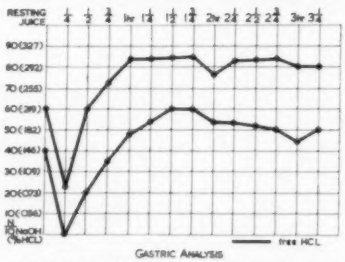
INDICATIONS: NULACIN tablets are indicated whenever neutralization of the acid gastric contents is required: in active and quiescent peptic ulcer, gastritis and other conditions of gastric hyperacidity.

Dosage: Beginning half-an-hour after food, a Nulacin tablet should be placed in the mouth between the cheek and the gum and allowed to dissolve.

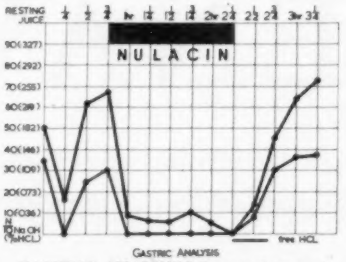
During the stage of ulcer activity, up to three tablets an hour may be required. During quiescent periods, for prophylaxis in peptic ulcer and for the relief of discomfort due to gastric hyperacidity, the dose of Nulacin is one or two tablets between meals.

NULACIN tablets are not advertised to the public and have no B.P. equivalent. They may be prescribed on E.C.10. The dispensing unit of 25 tablets is free of purchase tax. (Basic price to N.H.S. . . . 2/-). Also available in tubes of 12.

NULACIN tablets are prepared from whole milk combined with dextrins and maltose, and incorporate magnesium trisilicate 3.5 grs.; magnesium oxide 2.0 grs.; calcium carbonate 2.0 grs.; magnesium carbonate 0.5 grs.; Ol. Menth. Pip. q.s.



GASTRIC ANALYSIS *Superimposed gruel fractional test-meal curves of five cases of duodenal ulcer.*

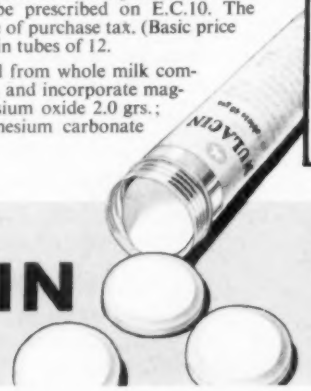


GASTRIC ANALYSIS *Same patients as in Fig. 1, two days later, showing the striking neutralizing effect of sucking Nulacin tablets (3 an hour). Note the return of acidity when Nulacin is discontinued.*

BIBLIOGRAPHY

Practitioner, 1957, **178:** 43
Practitioner, 1956, **176:** 103
Amer. J. Gastro. 1956, **26:** 665
Brit. Med. J. 1954, **1:** 46

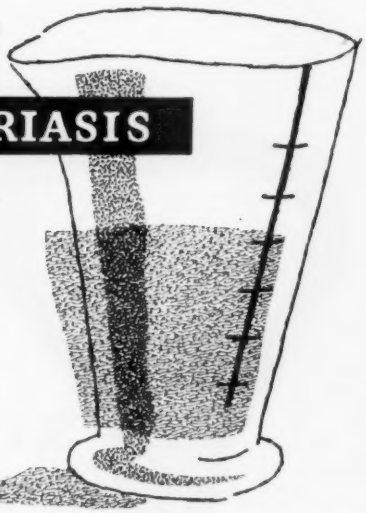
Further references to the literature and full information on Nulacin available on request.



NULACIN

HORLICKS LIMITED
PHARMACEUTICAL DIVISION
SLOUGH, BUCKS, ENGLAND

IN ASCARIASIS... OXYURIASIS



STILL SIMPLER TREATMENT NOW!

Today, the treatment of roundworm infestation has been reduced to still simpler terms. Just one dose of one fluid ounce of 'Antepar' Elixir completely eradicates roundworms.* No preliminary treatment is needed... no "follow-up" measures are necessary. 'Antepar' also provides the surest, simplest answer to threadworms —the course comprising single daily doses of the preparation for seven consecutive days. 'Antepar' treatment is genuinely *pleasant*, too. The Elixir proves particularly popular; the Tablets, which are specially flavoured for pleasant chewing, are available for those who prefer this type of medication.

'ANTEPAR' TRADE MARK

today's conclusive *answer to roundworms and threadworms*

NOW IN TWO FORMS

ELIXIR — contains piperazine citrate equivalent to 500 mgm. piperazine per teaspoonful (3·5 c.c.). *Bottles of* 1, 4 *and* 20 *fl. oz.*

TABLETS — attractively flavoured for chewing. Each provides 500 mgm. piperazine. *Strip packs of* 20; *bottles of* 250

*This dosage is for older children and adults. Still smaller dosage is needed for young children. When employing 'Antepar' Tablets in ascariasis, a single dose of six or eight tablets is recommended—according to the patient's age.

BURROUGHS WELLCOME & CO. · LONDON
(THE WELLCOME FOUNDATION LTD.)

Associated Houses: AUCKLAND · BOMBAY · BUENOS AIRES · DUBLIN · JOHANNESBURG KARACHI · MONTREAL · NAIROBI · NEW YORK · RIO DE JANEIRO · ROME · SYDNEY

designed for one purpose

only one sulphonamide

is designed specifically for the treatment of B.coli infections

SELECTIVE The action of Urolucosil is confined to the urinary tract. Very soluble, it is rapidly excreted largely unchanged, in the urine.

LOW DOSAGE Urolucosil is effective in about one-fifth of the dosage used for most sulphonamides.

NO CRYSTALLURIA With Urolucosil, crystalluria does not occur. Extra fluids are not required.

LOW COST Twenty-five tablets taken over 5-7 days usually suffice to control an acute infection.

NON-TOXIC AND FREE FROM SIDE EFFECTS

UROLUCOSIL
Sulphamethizole TRADE MARK

DOSAGE:
ADULTS — *one or two tablets five or six times a day.*
CHILDREN — *half to one tablet five or six times a day.*

In most cases, five tablets daily for five days will render the urine sterile.

PRESENTATION:
UROLUCOSIL TABLETS 0.1G. *are available in bottles of 25, 250 and 1,000.*

*When pain is a problem in chronic urinary tract conditions PYRIDIUM is the specific urinary tract analgesic. Dose of Pyridium: two tablets three times a day.

WARNER WILLIAM R. WARNER & CO. LTD., EASTLEIGH, HAMPSHIRE.

URO390

"Never neglect the opportunity
of learning from another doctor:
in this context about the contents of his bag"

Practitioner (1957) 179, 626

Bellergal

BY **SANDOZ**

is in the bag!*

Bellergal is always at hand for the symptomatic treatment of a wide variety of **psychosomatic disorders**

TABLETS:
0.1 mg. total alkaloids of belladonna
0.3 mg. Ergotamine Tartrate B.P.
20 mg. Phenobarbitone B.P.

* Bellergal has a place in "*The Doctor's Bag*"—*Practitioner* (1957) 179, 624

Sandoz Products Limited
Sandoz House
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THE PROBLEM

To obtain high blood levels of theophylline easily . . .

For oral aminophylline therapy to be fully effective it is necessary to give a dose sufficient to produce high blood theophylline levels. However, because of gastric irritation vomiting often results. Alternative therapy with enteric coated tablets or suppositories is unreliable, and parenteral aminophylline is inconvenient.

THE SOLUTION

Oral 'Theodrox' . . .

The combination of dried aluminium hydroxide gel and aminophylline in 'Theodrox' ensures full therapeutic response with the minimum of gastric upset. Reproduceable blood levels comparable with those obtained from intramuscular injection can be obtained.

THE RESULT

A full Therapeutic response . . .

THEODROX REGD.

Recent work[1,2] has shown that synthetic derivatives of theophylline are mostly unsatisfactory and all are more expensive.

Each 'Theodrox' tablet contains 3 grains aminophylline and 4 grains dried aluminium hydroxide gel. 'Theodrox' is also available combined with $\frac{1}{8}$ grain phenobarbitone where a degree of sedation is also required.

REFERENCES

1. *Brit. Med. J.* (1957) *2* : 67
2. *Ibid.*, page 74

DOSAGE . . .

ASTHMA:— two tablets, repeated in 2-3 hours if necessary to control paroxysm and dyspnœa. For prophylaxis, one tablet 4 times daily.

DIURETIC:— two tablets initially, then one or two tablets three times daily.

ANGINA PECTORIS:— four to eight tablets daily. In suitable cases 'Theodrox' with Phenobarbitone tablets can replace some or all of the 'Theodrox'.

PACKS:— Bottles of 25, 100 and 1,000 tablets.

RIKER

'Theodrox' (Brit. Pat. 727831) is a registered Trade Mark of

RIKER LABORATORIES LIMITED
LOUGHBOROUGH LEICS.

new

Specifically for

effective symptomatic relief

in **PARKINSON'S SYNDROME**

COGENTIN

TRADE MARK

TABLETS BENZTROPINE METHANESULPHONATE

'COGENTIN' is recommended for use in the symptomatic and palliative treatment of all aetiological groups of Parkinson's syndrome—arteriosclerotic, post-encephalitic, or idiopathic. It is mainly effective in relieving parkinsonian tremor and rigidity and in ameliorating associated symptoms such as sialorrhoea, drooling, mask-like facies, oculogyric crises, speech and writing difficulties, dysphagia, gait disturbances, and pain and insomnia due to cramps and muscle spasm. It may be given alone or in conjunction with other drugs.

Adequate daily dosage ranges from 0.5 mg. to 2 mg. in most instances.

'COGENTIN' is supplied in bottles of 100 quarter-scored tablets, each tablet containing 2 mg. of benztropine methanesulphonate.

- ***Particularly effective in the relief of tremor and rigidity***
- ***Remarkably free from side-effects***

Literature will gladly be supplied at your request.

MSD MERCK SHARP & DOHME LIMITED, HODDESDON, HERTS.

Today's foremost antibiotic

Of all Lederle's major contributions to medical science for the benefit of mankind, none has had a more spectacular rise to fame than ACHROMYCIN tetracycline. Introduced by Lederle in 1954, ACHROMYCIN set a record for rapid acceptance by the medical profession. It has now become recognised as today's foremost antibiotic. ACHROMYCIN has everything a true broad-spectrum antibiotic must have. It is unexcelled for its wide range of antimicrobial activity, faster diffusion, greater stability and more prolonged action. It results from Lederle's leadership in antibiotic research . . . it leads the field in clinical reliability and flexibility.

ACHROMYCIN*

TETRACYCLINE *REGD. TRADEMARK

Dosage forms for every need . . . Well tolerated by all age groups

Lederle

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But for those who find sleep difficult, prescribe . . .

'SONERYL'
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BUTOBARBITONE

or

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BUTOPHEN WITH CODEINE

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PROMETHAZINE / BUTOBARBITONE

when pain causes insomnia

for refractory cases of insomnia and also for pre- and post-operative sedation

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(Compound I.S.499)

SUPPRESSES ACID SECRETION

All day and all night control of gastric acid in peptic ulcer is made possible by a dose of NACTON 3 times a day—and one at night.

NACTON specifically reduces gastric secretion by as much as 70%, providing fundamental, long-term and specific control of hyperacidity, not merely relief of symptoms.

in peptic ulcer

EACH TABLET CONTAINS	2 mg. of (1-methyl 2-pyrrolidyl) methyl benzilate methyl methosulphate

PACKAGES & BASIC N.H.S. COST	50 tablets	4s. 4d
	250 tablets	20s. 0d.

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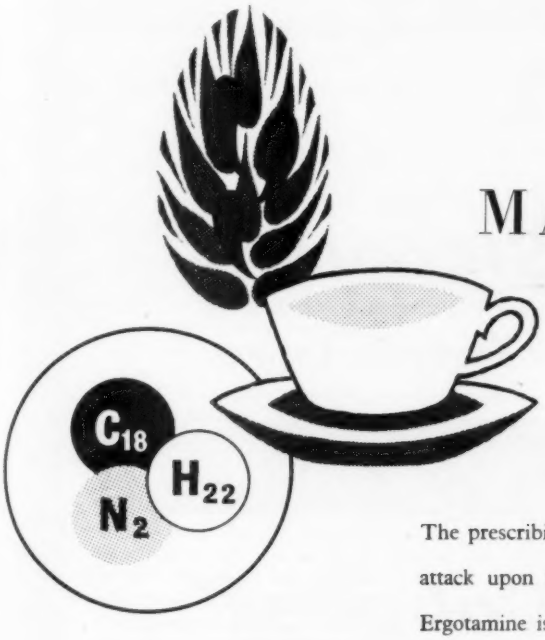

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SOME PATHOLOGICAL ADAPTATIONS IN THE PERIPHERAL CIRCULATION *

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ADAPTABILITY, in living organisms, is a prerequisite of survival. It is fundamental to the doctrine of natural selection, and on the smaller stage of the human species it is a daily experience. Within the yet narrower compass of the bodily economy the same truth holds and persists, though in less obvious fashion, down to the ultimate constituents of the body—the cells.

The cell is in many cases more adaptable than the organ of which it is a part, and the organ than the body as a whole. The survival and execution of the functions of cells depend upon the circulation. The circulation has three main parts: the cardiac pump; the conduit tubes, arteries and veins; and the metabolic area, the capillaries. A great deal has been discovered about the adaptability of the heart, but rather less about that of the conduit system, whilst the changes in the capillary area—in a sense the latest comer in the field of physiological research—are still less completely known.

When we pass across the grey band which divides what is physiological from what is pathological, and enter the dark area which is the true domain of pathology, we are in a territory full of pitfalls and quagmires. The investigator faces the double difficulty that he has both to try to find out the anatomical changes in an organ—changes which essentially are not static but increase with disease and decline with recovery or become adapted to a permanently abnormal state of affairs—and to interpret these as effects in the organ and the body. In pathological investigation, as is logical, anatomy has generally led physiology; and in what I have to say I shall be concerned chiefly with anatomical changes.

I am very conscious that my discourse may contain more of speculation than Matthew Stewart would have approved by his own high standards; but it is my purpose to be suggestive rather than dogmatic and to deal with matters which cannot at the moment be regarded as settled.

Hyperæmia and Ischæmia

The morbid changes in a system of conduits can result in a general way either in their widening or narrowing, and in a supply of either more or less blood. Unfortunately for the investigator it is not as simple as this, since "blood" is not a substance of constant composition, nor are the tubes through which it flows of fixed size, structure, or function. The blood is varying all the time it is making the circulatory circuit, and (what is more) it is varying at different and inconstant rates and travelling at different and variable speeds.

In an attempt to simplify the matter—for it is the aim of the scientist to reach general principles—we ignore much of this and roughly divide the conditions we encounter into *hyperæmia* and *ischæmia*. The former we subdivide into *active* and *passive*, and the latter into *acute* and *chronic*. In this lecture I am concerned essentially with the arterial side of the system; so we need consider only active hyperæmia and ischæmia. Active hyperæmia is due to relaxation (local or general) of the arterioles; ischæmia to functional constriction or anatomical occlusion.

Active Hyperæmia

Hyperæmia is an important part of the inflammatory reaction; but with this aspect of it I do not intend to deal. The condition of chronic active hyperæmia, meaning an excessive supply of fully oxygenated blood to tissues having normal requirements, is a rarity and intrigued the great John Hunter as a possible cause of hypertrophy. It certainly occurs with increased demand in hypertrophy, but it seems to be secondary, or at most coincidental. It is sometimes seen in malignant growths, as for example in certain acute carcinomata of the breast and in some sarcomata which have many of the features of acute inflammation and are characterised by very rapid growth. An obvious case of such a condition, occurring without abnormal tissue demands, would seem to be arteriovenous fistula; but this is not really admissible, since it involves complicated changes on the venous side producing abnormal pressure in the venous system and symptoms of chronic venous congestion. Nevertheless the skin temperature is raised in the chronic phase; there is an increase in the size of the limb; and, if the fistula is present before the epiphyses have united, the length of the bones is increased.

It might be thought that the effects of chronic active hyperæmia could be produced by keeping animals in an atmosphere of increased oxygen tension for long periods; but this gives no answer, because damage to the lungs results and causes death with pneumonic changes which produce anoxia. Similarly, in local venous obstruction, such as may result from destruction of the venous valves, the picture is complicated by stasis, and here too we cannot disentangle the effects of anoxia.

I would, however, like to quote a rather remarkable case I saw recently.

A man of about 50 had his left leg flexed and useless for many years from some chronic local venous disease, which for the past three years had been complicated by ulceration. The venous valves were destroyed by old thrombophlebitis. There was chronic osteomyelitis of the lower ends of the tibia and the fibula with much formation of new bone. The skin over his leg was ichthyotic. In spite of prolonged disuse this leg was larger than its fellow, which appeared quite healthy and on which the patient walked, and arteriography showed all the arteries in the diseased limb to be unusually dilated. The increase in size of the disused calf-muscles was not due to muscular hypertrophy but to a great infiltration with fat between atrophied muscle-bundles—so much so that a transverse slice of the leg, including the bones, floated.

This recalls the appearance of the leg muscles in pseudo-hypertrophic myopathy in children. The factors which lead to the latter disease are unknown, but the present case may provide a pointer, in that we had a combination of disuse plus chronic active congestion in the arterial circulation, the latter presumably due to the chronic inflammation in the bones, together with venous stasis.

Ischæmia

When we come to consider ischæmia, the problem is more manageable, since from its nature it is so often associated with arterial disease. It is essentially a process which manifests itself at the periphery of the arteriolar/

* Matthew Stewart memorial lecture given in Leeds on Nov. 28, 1957.

capillary system. This, I should point out, is not synonymous with the extremities or with the body's surface. The peripheral part of the liver's circulation, for example, is at the centres of the lobules, and of the kidney at the glomerular tuft and just beyond. The extremities and the skin, however, attract our special attention because the main effects of ischæmia—colour changes, pain, œdema, hæmorrhage, and eventually necrosis—are most readily seen and experienced there.

Acute peripheral ischæmia.—Grave ischæmia may occur without anatomical arterial disease, as a result of peripheral spasm. We are all acquainted with physiological degrees of this in cold fingers and toes, and with more severe grades in chilblains and frostbite. A special case is the Raynaud phenomenon, where it is suggested that there is some unexplained oversensitivity to cold in the digital arteries. Acute peripheral ischæmia resulting from central circulatory deficiency, severe enough to produce gangrene, is sometimes seen and was mentioned by Paget in 1853, when he wrote of a man who cut his throat and lost so much blood that " the nutrition became impossible in one of those parts to which blood is more difficultly sent, and before he died his nose sloughed ". Brodie speaks of a drunken man who " being bled to an inordinate extent was seized with gangrene of both feet ". Such an acute condition was recently encountered in the case of a man of 62, suffering from left ventricular failure and coronary disease, who developed gangrene of the nose and the left ring-finger, with early gangrene of other fingers. Here we had some information about the deep peripheral circulation, since the effective renal blood-flow was measured at the time and found to be only 34 ml. per min. (normal 700 ml. per min.). At postmortem examination advanced stasis was found in the glomerular capillaries, similar to that which precedes symmetrical renal cortical necrosis. In another case, in a young woman, this renal condition was fully developed, along with gangrene of the nose, cheeks, and fingers. These are special examples of acute peripheral ischæmia severe enough to cause necrosis but not due to any organic primary peripheral vascular disease.

Chronic peripheral ischæmia.—The basis of chronic ischæmia is in the arterial system, and the most common cause is narrowing of the arteries due to atherosclerosis and its effects.

Degeneration or Incrustation?

For almost a hundred years the teaching of Virchow dominated our ideas on the genesis of atheroma, but recently the whole of this has been called in question by Duguid, who has revived and re-presented in modern form the earlier view of Rokitansky—that the atheromatous plaque (the hallmark of the disease) is an " incrustation " on the inside of the artery. Virchow held that it was a degeneration in the intima with lipoid deposition and that the other changes were secondary to this. Duguid regards a thrombus as the starting-point and illustrates its development in the way shown in his papers (1949 et seq.). These views have aroused great interest, and I should like to consider them briefly, and especially the objections that have been raised against this simple explanation.

(1) It has been asked why, if a thrombus becomes an atheromatous plaque, do we so commonly see quite a different condition developing from a thrombus—often alongside an atheromatous plaque (fig. 1), an appearance

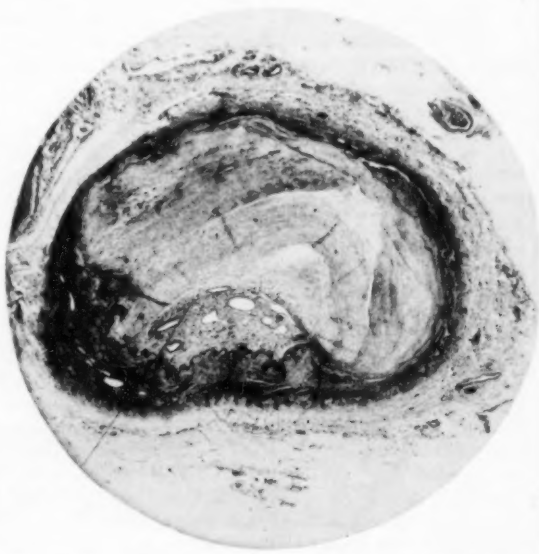

Fig. 1—Atherosclerosis, followed by thrombosis and canalisation, in anterior tibial artery. Note internal elastic lamina opposite recently canalised area and its absence opposite older atheromatous lesion. (×15.)

well known to pathologists? I shall leave this point for the moment and come back to it later, for it is fundamental to much of what I have to say on this matter.

(2) How are we to explain the great accumulation of lipoid substances in the plaque—a quantity which is often far greater than can be formed by the breakdown of a local thrombus? This difficulty is common to either theory. The lipoid has to come from outside, and the mechanism may be the same in either case. The point gives us no assistance. But I think it is associated with one or more red herrings—if I may introduce such a metaphor—which have helped to maintain Virchow's view:

(1) There is the association between atheroma and diabetes. In the days before the discovery of insulin, diabetes was treated by a high-fat and high-protein diet and carbohydrate starvation. Under such a regime heavy lipæmia was a common result, and diabetics showed extensive atheromatous lesions with heavy accumulation of lipoids. I believe the explanation to be not that the atheroma was caused by the lipæmia but that —diabetes being a disease in which lipoids tend to accumulate —this feature was favoured and exaggerated by the abnormal quantities of lipoid in the blood and tissue fluids.

(b) The second red herring was the discovery that by feeding rabbits on large amounts of cholesterol, lesions resembling atheroma could be induced in the aorta. More critical analysis has shown that the analogy is not really very close, and these investigations have contributed little if anything to the solution of the problem. Under modern treatment of diabetes I think we must review the association between the diseases. My own experience, over the past twenty years, has been that diabetics do not come to operation for ischæmia due to atheroma any earlier than non-diabetics (71·5 and 71 years respectively), and on such a basis there are no grounds for believing that peripheral vascular disease is influenced by diabetes.

(3) Why are there no iron salts in a formation claimed to have developed from a thrombus?

(4) The fate of arterial thrombi in a disease in which they are a main feature—Buerger's disease—is very different.

(5) Thrombi in veins only rarely develop into atheromatous plaques. But veins have quite a different anatomical structure and lack the features which, I suggest, play a part in the formation of the plaque.

The Thrombus and the Reaction

I believe that the truth of the matter lies with Duguid, and that the difficulties I have mentioned are answerable and are related to the nature and composition of the "thrombus", and to the vascular reaction. In fact, if we meet the first of these objections we have the answer to most of the others.

There is no doubt that we can find abundant evidence that certain thrombotic masses can be incorporated in the vessel wall and give rise to lesions indistinguishable from atheromatous plaques.

Figs. 2 and 3 show the popliteal artery of a man of 42 with Buerger's disease, with a thrombus extending down as far as the anterior tibial artery. The thrombus which only partially occludes the vessel, has become covered with endothelium, and is in process of incorporation into the artery wall, being covered on its inner surface with a living cellular membrane formed in connection with the tunica intima. Underneath there is a central formless mass corresponding to the necrotic centre of the atheromatous plaque, and we also see a "splitting" of the internal elastic lamina at the margin of the plaque, such as is so often figured in descriptions of atheroma. Beneath the thrombus the internal elastic lamina is still intact.

Fig. 2—Thrombus, partially occluding tibiopopliteal trunk, becoming incorporated into lateral wall of artery in man, aged 42, with Buerger's disease.

If we agree then that a thrombus can develop into a lesion having the histological characters of atheroma, we come back to the question: Why do not all thrombi do so? The answer is the one I have already suggested—that this depends on the nature and completeness of the thrombus and the reaction of the arterial wall. We are inclined to ignore the fact that "thrombi" vary greatly, from purely platelet thrombi to massive clots formed from whole blood and containing all its chemical and cellular constituents in approximately normal ratios. I agree with Duguid, in his later papers, that it is not the gross thrombus, figured in his original paper, which ordinarily undergoes a metamorphosis into an atheromatous plaque: the thrombus in which this change takes place is the one constituted mainly of fibrin and platelets, which is slowly deposited, is eccentrically placed, and may grow by slow accretion.

We have learnt of late, to some extent since arterial grafts have come into use, the great growth activity of the endothelium which enables it to line a graft with great speed, and it is fair to assume an equal activity in the covering in of a mural thrombus. I would modify Duguid's original diagram to one which takes rather more account of the activity of the endothelial tissue and of the vessel wall. I think there is no doubt that the endothelium and cells associated with it can form reticulin and collagenous tissue.

Fig. 3—Section of same artery as in fig. 2, showing incorporation of thrombus and formation of new elastic layers. (×6·5.)

Organisation of Thrombus

Crawford and Levine (1952) have emphasised this, Geiringer (1951) has mentioned superficial giant capillaries proceeding for a short distance from the lumen, whilst Duguid (1949) speaks of the collagenous metamorphosis of the superficial layer of thrombus beneath the endothelium. Under certain conditions this endothelial activity may be enormously extended and result in the canalisation of the thrombus (Dible 1958), but in the special type of mural thrombus leading to the formation of the atheromatous plaque the development ceases, unless further accretions form on the surface. The atheromatous plaque, therefore, becomes as it were encapsulated and thrust aside from the lumen, and there is little or no persisting

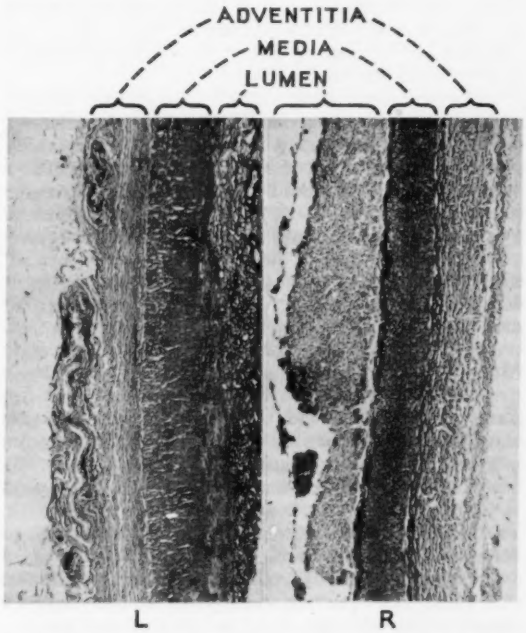

Fig. 4—Two ulnar arteries from the same patient with (L) old canalising thrombus, and (R) very recent thrombus. Note increase in vasa vasorum of middle coat in left vessel and absence of such reaction in right. In spite of this vascular response vasa vasorum do not penetrate to thrombus. (×36.)

stimulus to further change from the side of the lumen; but, if the area of narrowing is converted into a complete occlusion by the later formation of an acute thrombus, this will have a different fate. Fig. 1 shows the outcome of such a condition, but the second thrombus has undergone canalisation, which is quite another form of adaptation of the damaged circulation and a different pathological process, of which I shall speak in a moment.

So far we have ignored the rest of the vessel wall. The middle coat does not accept the presence of a thrombus passively but reacts, notably by an increased prominence of the vasa vasorum (fig. 4), which in the case of atheroma show a limited tendency to vascularise the plaque. But here there is an apparent barrier; and this, as I have suggested elsewhere (Dible 1958), seems to depend upon the presence of an intact internal elastic lamina. I believe that, in a healthy vessel wall, this opposes an impassable bar to the ingrowth of vessels from the media, but in the depths of the atheromatous patch the lamina commonly breaks up or disappears as the patch grows older, with the result that the barrier is removed and some vascularisation of the patch may be seen on its deep side.

A good deal of attention has been paid, notably by Winternitz et al. (1938), to hæmorrhages into the depths of atheromatous plaques in the coronary arteries. The more advanced of these invading vessels have a capillary structure and may be the source of hæmorrhage, which seems particularly liable to occur in a pulsating vessel containing rigid and sometimes calcified plaques, in which sheering strains would tend to develop.

Canalisation of Thrombus

In dealing with the possible and limited vascularisation of the atheromatous plaque I have been leading up to the quite different fate which an intra-arterial thrombus may undergo—a thrombus such as I have visualised as finally occluding our narrowed atheromatous vessel (fig. 1), or produced in the healthy artery of a young person, or as develops in Raynaud's disease.

The expression " organisation " is often used in connection with the changes in an occluding thrombus—I think not wholly accurately, for the process is not exactly comparable to the conversion of a fibrinous exudate, or a mass of effused blood, into living fibrous tissue, such as is seen in the organisation of a fibrinous pericardial exudate. The result of organisation is a scar: it is a form of healing in which a minimum of new fibrous tissue is formed, with the requisite minimum of vessels to nourish it derived from the existing blood-vessels of the part. In such a process in an artery the thrombus would be converted into a plug of fibrous tissue, with its own little circulation supplied by the arteries of the vessel wall and returning its blood to the veins of the vasa vasorum. But is this what happens? No; we find a development of new blood passages and vessels within the thrombus, quite independent of the vasa vasorum. And why is this? We have to remember that an artery has two sources of blood-supply, and that these are functionally independent. The one is from the contained blood, and the other, to the major part of the wall, comes from adjacent small arteries but not directly from the main vessel. The fact that these vasa vasorum come from smaller adjacent arteries means that the blood is supplied at a suitably reduced pressure. It seems to me that these two divisions are functionally and anatomically independent, and that their territorial demarcation in medium muscular arteries corresponds to the internal elastic lamina. I am not prepared to say whether this is an actual anatomical barrier or whether it merely corresponds to a physiological demarcation: all I know is that it appears to exist.

We know that intravascular occluding thrombi undergo this canalisation, and the evidence of histology is that these are through vessels which do not communicate with the vasa vasorum. In fact if they did, and blood at high pressure from the lumen of a large artery were to pass directly into the small vessels in an organised thrombus, very abnormal hæmodynamic conditions would probably arise, and possibly the flow in the arteries of the vasa vasorum concerned might be reversed, and a direct arteriovenous communication develop with the veins of the arterial wall. On the other hand, the exposure of these through channels to the full pressure of the blood in the occluded artery has the beneficial effect of distending them.

I therefore conclude that the canalisation of a thrombus is a wholly different process from its organisation—different in its mode of development, the vessels involved, and its purpose and effect. The purpose of canalisation is to restore as far as possible a through circulation, and this may be accomplished to various degrees. Elsewhere I have illustrated the condition in canalised arteries and have described the stages of its development (Dible 1958).

The development of this new system of vessels within the boundary of the internal elastic lamina may take place from mesenchymal lining cells of the tunica intima but may also be contributed to by cells present in the circulating blood. Such vessels are independent of the intrinsic circulation in the middle coat, and an important point in support of this argument is that the newly formed canalising vessels not only lie inside the internal elastic lamina but also are oriented in the direction of the artery's lumen, whereas the vessels in the middle coat of the artery's wall are oriented at right angles to these, and the two circulations do not communicate.

But do the vasa vasorum play no part? I said earlier that they react to the presence of a thrombus, and this is so. Their increased development, which is so obvious in fig. 4, may well be due in part to the effect of the thrombus in cutting off the nutrition of the parts of the arterial wall nearest to the lumen, which are normally nourished by imbibition. And I believe that their function is limited to this, at any rate in the beginning. I do not deny that they may eventually penetrate the thrombus, but this appears to be a late change, associated with a break-up and disappearance of the internal elastic lamina such as we also find in the depths of an atheromatous plaque. I think it possible that in this way the skeleton of the canalised thrombus may also receive a part of its blood-supply from the vasa vasorum (fig. 5) and the rest from the canalised vessels. Thus organisation and canalisation of a thrombus may coexist although the two circulations do not commingle. This is simply a development of the

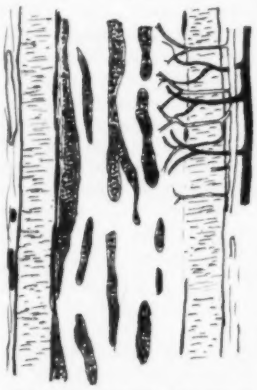

Fig. 5—Hypothetical diagram of blood-supply from vasa vasorum to parts of framework of canalised thrombus.

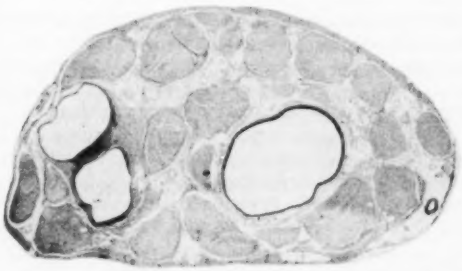

Fig. 6—Dilated collateral arteries in sciatic nerve of man, aged 73, with senile atherosclerotic ischæmia. (×9·5.)

essential dual blood-supply of the arterial wall and appears to be its logical consequence.

Collateral Circulation

Where the arterial circulation is occluded, whether slowly or acutely, the blood tends to be diverted into other channels, known as collaterals. The collateral arteries are already formed vessels—so far as my investigations go, no new arteries are formed—and many of them are the named branches of the anatomists. Together they make up the arcade systems so characteristic of much of the arterial supply to the skin, muscles, and limbs. They are found in the subcutaneous tissues, in the intermuscular planes, on the periosteum, and in the nerve trunks, and I have produced evidence that the muscular vessels may play a part; indeed it seems possible that ischæmic claudication of the calf-muscles may be due to the bypassing of the functional muscular tissue, to enhance the blood-supply to the skin and subcutaneous tissues of the toes threatened with gangrene.

These collaterals, in fulfilling their function, dilate into thin-walled vessels. This surprised me when I first began to examine them, because I was obsessed with the idea, which I suppose many pathologists indulge, that hypertrophy of an artery meant thickening of its walls—a picture very familiar to us in hypertension. Now the condition of these thin-walled tubes is intriguing. It is not technically easy to compare them with similar vessels which are not acting as collaterals, but I have measured similar vessels in the normal and the enlarged states by utilising the arteries of the sciatic nerve (fig. 6). From this it emerges that the circumference may be increased to as much as twelve times, but with this the thickness of the wall is reduced to half the normal size (fig. 7). This leads to the interesting question of the change in the cells which make up the muscle wall. The great disproportion between circumference and thickness clearly rules out simple stretching. The nearest analogy is to the pregnant uterus: Kölliker (1853) states that, by the end of the sixth month, the length of the uterine muscle-cells increases from seven to eleven times, and their thickness from two to five times, with the result that they enlarge in all dimensions. It is generally accepted that they also increase in number. In the wall of the arteries which we are considering the condition is different because, though the vessel is dilated, its wall is thinned. But, since this thinning is less than it would be if the wall were merely stretched, either the cells must thicken or new cells must be added.

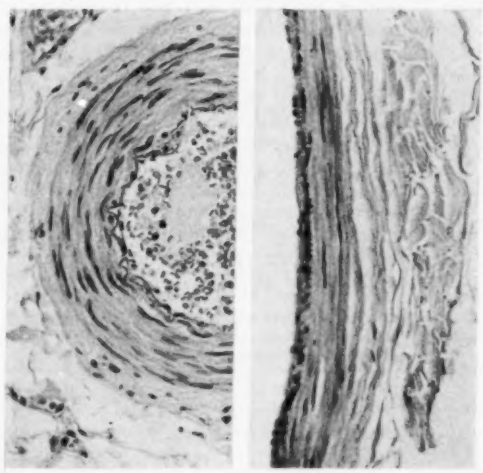

Fig. 7—Normal sciatic (comites nervi) artery (L) compared with larger vessel in fig. 6 at same magnification (R). Note relative thinning of muscular wall and of muscle nuclei in R. (×150.)

The number of cells in a cross-section of an artery may be estimated approximately by counting the nuclei, and in the case in point this shows some 500 cells in the section of the dilated artery compared to 200 in the corresponding control artery. What is the condition of the individual cells which causes the vessel to become thinner although their number is increased? If all the cells were to undergo the same change in size, and extra ones of the same size were simply packed in, the result could be cells twelve times the length and a fifth of the thickness of the normal. But this tremendous elongation seems unlikely, and it appears more reasonable to suppose that, like those of the uterus, they are perhaps six times the length but, unlike them, only about two-fifths of the normal thickness. This is very speculative because we do not know the extent to which they overlap each other. The exact change will have to be decided by maceration and dissection, but in any case the arterial muscle-cells must be much thinner in proportion to their length.

At this point I thought I might get some further information from the size of the nuclei, because the nuclei figured in enlarged uterine cells are definitely enlarged in all dimensions. Comparing the size of the muscle nuclei in different arteries I found (what I did not know before but might have deduced) that the size of the nucleus in these cells is related to the size of the artery. Large vessels have cells with large nuclei, and small vessels cells with small nuclei. I was therefore driven back to comparing sciatic arteries and found that the length of the nuclei in the cells I knew to be greatly elongated were not measurably greater than those in the control vessel. On the other hand, it was evident from inspection that they were decidedly thinner (fig. 7), though the difference was difficult to measure. On taking mean figures and comparing the bulk of each nucleus, as the product of length and breadth, it appeared that the normal cell nucleus is about twice as bulky as the nucleus of the elongated cell. This rather surprising result seems to suggest that, in the maximally enlarged collateral, an element of atrophy may supervene.

It is obvious that the stimulus to this peculiar alteration in the arterial structure must be quite different from that which produces the thick-walled artery of hypertension. Wherein lies this difference? As regards hæmodynamics, there is an analogy with arteriovenous fistula, in which the

artery discharging into the vein dilates, the reason seemingly being the lack of peripheral resistance, and the result an increased blood-flow. Such factors may operate in the ischæmic limb. For example, a terminal anterior branch of the peroneal artery normally inosculates with the anterior tibial and shares its tension at the point of junction. But suppose, as often happens, the anterior tibial becomes occluded proximal to this anastomosis, the tension at and beyond the anastomosis is immediately reduced, such pressure as there is being maintained mainly by the flow of blood from the lateral plantar artery. In chronic peripheral ischæmia from atherosclerosis the arteries of the foot are commonly patent and patulous; so such an occlusion as I have supposed would permit an excessive flow of blood from the peroneal branch into an area of abnormally low tension in the foot. It is common for the posterior tibial artery also to be occluded, which would still further decrease the pressure in the vessels of the foot and favour an even greater flow of blood through the peroneal anastomosing branch, which would dilate to pass the amount of blood normally transmitted by these two larger channels as well as its own normal contribution.

It therefore seems that an artery in a position to transmit blood against a lowered peripheral resistance will dilate, whereas one transmitting blood against an increased peripheral resistance will thicken.

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MODE OF ACTION OF ORAL ANTIDIABETIC COMPOUNDS

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IN the three years that have elapsed since the publication of the first papers on carbutamide (Achelis and Hardebeck 1955, Bertram et al. 1955, Franke and Fuchs 1955) many clinical observations and experimental results have been published dealing with various possibilities of site and mechanism of the hypoglycæmic effect of this compound and other " oral antidiabetic drugs ".

We describe here the situation as we see it today, emphasising beforehand that a full understanding of the details of this mechanism has, of course, not been obtained—not even a high degree of certainty about its broad outline.

Action on or via Endocrine Glands

In the treatment of diabetes mellitus the effect of the oral antidiabetic drugs is similar, in many ways, to that of giving small doses of insulin. There is not, however, sufficient evidence that these drugs provoke an increase in the production and delivery of insulin from the beta cells of the pancreatic islets.

In experiments on animals conflicting results have been obtained from the study of islet-cell volume (Ashworth and Haist 1956, Kinash 1957) as well as from investigations of the hypoglycæmic effect of small amounts of antidiabetic compounds injected directly into the pancreaticoduodenal artery (Loubatières 1946, Colwell et al. 1957, Houssay et al. 1957a and b).

Pozza et al. (1956) made cross-circulation experiments with carbutamide in eight pairs of dogs. The blood-sugar level fell in the recipient dogs, which received blood from the pancreatic vein of the carbutamide-treated donor dog; the blood-sugar level did not fall in dogs connected to the mesenteric vein of donor dogs. However, only average figures of changes in blood-sugar levels are given, and this kind of experiment does not seem to have been repeated by other workers.

Some workers have described slight and inconstant changes in the staining reactions of the beta cells in animals given oral antidiabetic compounds (Loubatières 1955, Kracht and Rausch-Stroomann 1956), but in the rat, at any rate, we feel convinced that no change takes place in either the shape or the granulation of the insulin-producing cells (Lundbæk and Nielsen 1958) (see table).

Another kind of " insulin action " was envisaged by Mirsky, who reported that the oral antidiabetic compounds decreased the activity of insulinase in the livers of rats (Mirsky et al. 1956, 1957). Evidently a decrease in the activity of an insulin-splitting enzyme would be equivalent to an increase in the activity of circulating endogenous insulin. In concentrations comparable to those eliciting a fall of the blood-sugar level this effect on insulinase activity was, however, very slight and perhaps even dubious, and other workers have been unable to confirm Mirsky's hypothesis (Williams and Tucker 1956, Vaughan 1956, Cox et al. 1956, Williams 1957).

The breakdown of insulin has also been studied with radioactive insulin. Tolbutamide did not prolong the half-life of injected insulin labelled with ^{131}I (Wick et al. 1957, Berson et al. 1957, Volk et al. 1957).

Even if neither the production nor the amount of circulating insulin were increased by the oral antidiabetic drugs, insulin action might still be enhanced by inhibition of one of the anti-insulin hormones. Such a mechanism was one of the first to be proposed to explain the hypoglycæmic effect of these compounds. Several investigators reported that 2-(*p*-aminobenzene-sulphamido)-5-isopropyl-thiodiazole (I.P.T.D.), carbutamide, and tolbutamide severely damaged the pancreatic alpha cells, thought to be the most important source of glucagon (von Holt et al. 1956, Ferner and Runge 1956). Other workers found no damage to the alpha cells after administration of sulphonylureas (Volk et al. 1956, Goldner et al. 1957),

HISTOLOGICAL CHANGES IN PANCREATIC ALPHA AND BETA CELLS OF RATS AFTER ADMINISTRATION OF VARIOUS ANTIDIABETIC DRUGS
(From Lundbæk and Nielsen 1958)

Drug	No. of animals	No. of controls	Total dose (mg.)	Histological changes of	
				Alpha cells	Beta cells
Carbutamide ..	75	29	75–3375	0	0
Tolbutamide ..	44	11	,,	0	0
I.P.T.D. ..	28	9	,,	0	0
Synthalin A ..	10	3	20	+ + +	0
Total ..	157	52	—	—	—

and our experiments with short- and long-term administration of large and small amounts of carbutamide, tolbutamide, and I.P.T.D. in rats were completely negative (Lundbæk and Nielsen 1958) (see table).

A hypoglycæmic effect due to depression of other anti-insulin hormones seems to be excluded by the fact that the antidiabetic compounds are equally active or even more active in animals deprived of the hypophysis, the adrenal glands, the thyroid gland, the parathyroid glands, or the gonads (Loubatières 1955, Houssay and Penhos 1956, Lang and Sherry 1956).

Finally, if the hypoglycæmic action of the antidiabetic compounds were an " insulin-like " effect—directly or indirectly—it would be expected to be accompanied regularly by hypophosphatæmia. It has been reported that, in healthy people, intravenous tolbutamide decreases the amount of inorganic phosphate in the serum (Goetz et al. 1956, Frawley et al. 1957); but no change in the phosphate curve was found in diabetics in whom treatment with carbutamide or with tolbutamide significantly increased the tolerance of intravenous glucose, calculated on the blood-sugar values observed or on the " excess blood sugar " (Eskjær Jensen et al. 1958) (fig. 1).

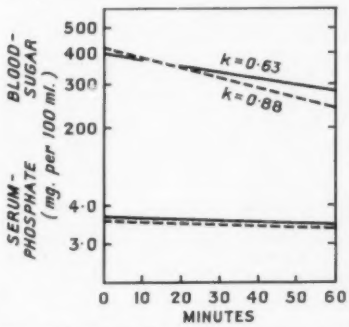

Fig. 1—Average curves of intravenous glucose-tolerance tests and serum inorganic phosphate before (continuous line) and during (interrupted line) treatment with antidiabetic drug (Eskjær Jensen et al. 1958).

On the whole it seems to us that, at present, the hypoglycæmic effect of the oral antidiabetic drugs has not been shown to be due either to augmentation of insulin action or to inhibition of the actino of the antidiabetic hormones.

Site of Action

Intestines

In rats given large doses of carbutamide orally in short-time experiments Friedlich et al. (1956) found a decreased intestinal absorption of glucose. In human beings treated with tolbutamide there is no such effect (Frawley et al. 1957), and it is well known that the antidiabetic compounds are very active when given intravenously.

Liver

Several workers have found that the oral antidiabetic compounds influence the output of glucose from the liver. Anderson et al. (1956, 1957), who catheterised the hepatic vein in tolbutamide-treated dogs, observed a pronounced inhibition of the release of glucose from the liver. This finding was confirmed by Schambye and Tarding (1957), and Kibler and Gordon (1956) observed the same phenomenon in diabetic patients.

A hepatic effect is also obvious from the fact that the administration of oral antidiabetic compounds increases the amount of glycogen in the liver (Bänder and Scholz 1956, Tyberghein et al. 1956, Miller and Dulin 1956).

The action on the liver has been studied further in vitro. The production of glucose in liver slices has been reported to be reduced in the presence of antidiabetic compounds (Clarke et al. 1956, Frawley et al. 1957), but other workers have found either no decrease or a decrease only at excessively high concentrations (Ashmore et al. 1956, 1957, Berthet et al. 1956). Glucose-6-phosphatase activity is inhibited by carbutamide and tolbutamide, but also only in very high concentrations (Ashmore et al. 1956, 1957, Tyberghein et al. 1956, Hawkins et al. 1956, Haist et al. 1957, Berthet et al. 1956, Kuether et al. 1956, 1957).

It thus seems that, although the precise mode of action in the liver has not yet been elucidated, the inhibitory action of these compounds on the output of glucose from the liver may be accepted. On the other hand, it is now known that the presence of the liver is no prerequisite for the hypoglycæmic effect of the oral antidiabetic compounds. A fall of the blood-sugar level is seen in hepatectomised animals given tolbutamide or N′-β-phenethylformamidinyliminourea (Phenethyl-diguanide, D.B.I.) (Dulin and Johnston 1957, Williams et al. 1957).

At the Periphery

The possibility of an action on the uptake of glucose at the periphery, has been less intensely explored, probably because some of the earlier studies were regarded as rather definitive proofs against such a mechanism.

In perfusion experiments with eviscerated animals no effect of carbutamide or of tolbutamide was found by Lang and Sherry (1956), Fritz et al. (1956), and Wick et al. (1956). Investigations of the arteriovenous blood-sugar difference after the administration of antidiabetic drugs in man have given conflicting results (Goetz et al. 1956, Recant and Fischer 1957).

The Gemmill method, by which the uptake of glucose and the synthesis of glycogen in the isolated rat diaphragm are determined in vitro, should be a useful tool for elucidating this problem. Clarke et al. (1956), Cahill et al. (1957), and Recant and Fischer (1957) reported that carbutamide and tolbutamide had no effect on the uptake of glucose from the medium; but D.B.I. increases the uptake of glucose by the rat diaphragm (Williams et al. 1957).

In our laboratory a clearly increased uptake of glucose was found with carbutamide as well as with tolbutamide and I.P.T.D., also in concentrations comparable to the levels achieved in the blood when these drugs are used in patients (Rafaelsen 1958) (fig. 2). We have also confirmed the finding of Williams et al. (1957) that D.B.I. has a strong effect on the uptake of glucose (fig. 2). The reason for the failure of earlier workers to observe the relatively mild effect of carbutamide and of tolbutamide on the uptake of glucose by isolated muscle is not quite clear. Most studies have, however, included only few experiments, and in the largest one (Recant and Fischer 1957) the standard deviation of the result is surprisingly high.

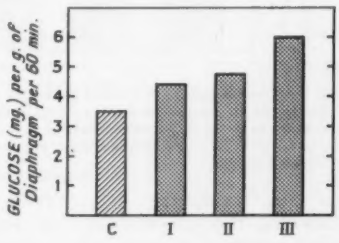

Fig. 2—Average uptake of glucose by isolated rat diaphragm incubated in glucose-containing medium with various oral antidiabetic compounds: C, controls; I, carbutamide; II, tolbutamide; III, phenethyldiguanide. The difference between each of these average values is statistically significant (Rafaelsen 1958).

The amount of glycogen in muscle is not increased either by carbutamide or by tolbutamide (Rafaelsen 1958); it is even decreased by D.B.I. (Williams et al. 1957, Rafaelsen 1958) (fig. 3). This finding suggests that the effect of the antidiabetic compounds on the carbohydrate metabolism of muscle differs from that of insulin, which in concentrations above 10^{-3} I.U. per ml. always induces the accumulation of glycogen in the isolated rat diaphragm.

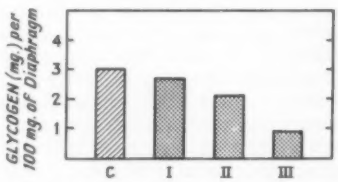

Fig. 3—Average glycogen content of isolated rat diaphragm after incubation in glucose-containing medium with various oral antidiabetic compounds: C, I, II, and III as in fig. 3. III is significantly lower than C, I, and II (Rafaelsen 1958).

On the other hand, we have found that these drugs influence the uptake of galactose and fructose without affecting that of *d*-arabinose, just as insulin does (fig. 4).

The details of the mechanism of this peripheral action on muscle are under investigation at present—especially the question whether it works by either of the two pathways of glucose metabolism in muscle recently described by Shaw and Stadie (1957).

Experiments in which the effect of oral antidiabetic compounds on the formation of $^{14}CO_2$ from glucose labelled with ^{14}C was estimated have been published by several laboratories. Wick et al. (1956) and Williams et al. (1957) found no demonstrable effect, but Miller et al. (1957) and Rice (1957) reported a rather pronounced increase in the combustion of glucose, measured by this technique.

It therefore seems that enhancement of the uptake of glucose at the periphery is one of the modes of action of

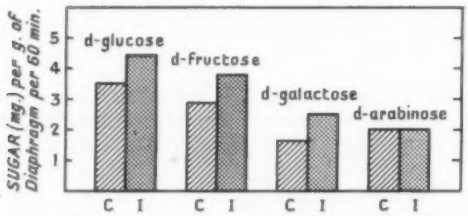

Fig. 4—Average uptake of various sugars by isolated rat diaphragm incubated in media containing these sugars and carbutamide: C and I as in fig. 3. Increased uptake of *d*-glucose, *d*-fructose, and *d*-galactose due to carbutamide are statistically significant (Rafaelsen 1958).

the oral antidiabetic drugs. Both the hypoglycæmia following the administration of these compounds in hepatectomised animals and the result obtained with isolated muscle point in this direction.

Prerequisites for Hypoglycæmic Effect of Antidiabetic Drugs

The German workers who introduced carbutamide noted that it had no effect, or only a very slight effect, on patients with severe diabetes mellitus (Franke and Fuchs 1955, Bertram et al. 1955). Most workers have found that I.P.T.D., carbutamide, and tolbutamide are without effect in animals with severe alloxan diabetes (Loubatières 1946, Achelis and Hardebeck 1955, Lang and Sherry 1956, Bänder and Scholz 1956).

Mirsky et al. (1957) compared the hypoglycæmic effect of tolbutamide on alloxanised rabbits with various degrees of hyperglycæmia. In rabbits with only mild hyperglycæmia an antidiabetic effect could be obtained, but rabbits with very high blood-sugar levels did not respond.

Other workers have emphasised that the action of insulin seems to be potentiated by antidiabetic drugs: when carbutamide or tolbutamide is given to pancreatectomised dogs receiving constant amounts of insulin, the blood-sugar level is lowered further (Sirek and Sirek 1956, Houssay et al. 1957, Ricketts et al. 1957).

These clinical observations and experimental results have been regarded by many workers as evidence that the presence of insulin, either from functioning beta cells or as administered insulin, is a prerequisite for the hypoglycæmic action of these compounds.

D.B.I., the latest oral antidiabetic drug to be discovered, does, however, produce hypoglycæmia in young patients with severe diabetes mellitus and in animals with severe alloxan diabetes (Williams et al. 1957), and in our preliminary in-vitro experiments with diaphragms of alloxanised rats a statistically significant increase in the uptake of glucose was found even with carbutamide (Lundbæk and Rafaelsen 1958).

Finally, a clearcut fall of the blood-sugar level can be obtained in the hypophysectomised pancreatectomised dog (Houssay et al. 1957a and b). Such dogs have no source of insulin, but their blood-sugar level is close to normal.

Perhaps the results obtained in different degrees of severity of clinical diabetes mellitus and of experimental diabetes in animals should be formulated not in terms of the presence or the absence of insulin in the organism but in terms of the degree of severity of the diabetes. It seems that the milder of the compounds—carbutamide and tolbutamide—act on carbohydrate metabolism to produce demonstrable effects when, and only when, the endocrine balance is normal or rather close to normal, not when a profound state of disequilibrium obtains. D.B.I. has a stronger effect and can normalise a more pronounced diabetic aberration of metabolism.

Summary

On present evidence the hypoglycæmic effect of the oral antidiabetic drugs cannot be explained by interference with the endocrine balance of the organism.

Among the modes of action of these compounds inhibition of the output of glucose by the liver and enhancement of the uptake of glucose at the periphery seem to be acceptable. The detail of the changes in enzyme activities probably involved in the hepatic and peripheral effects have not been elucidated.

It is suggested that the hypoglycæmic effect of the oral antidiabetic compounds is determined not by the presence or absence of insulin but by the degree of diabetic aberration of metabolism.

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HEINZ-BODY ANÆMIA DUE TO SALICYLAZOSULPHAPYRIDINE

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SALICYLAZOSULPHAPYRIDINE was introduced by Svartz (1942) for treating ulcerative colitis. Taken by mouth it is absorbed from the gut and is deposited in connective tissue, including that in the bowel, where aminosalicylic acid and sulphapyridine are gradually liberated. Free sulphapyridine can be detected in the blood.

It has been extensively used in the Scandinavian countries (Svartz 1948, 1954, 1956, Lagercrantz 1949, 1955), and has been used in America under the names of 'Azopyrin' and 'Asulfidine' (Morrison 1952, 1953). Bargen (1955), who has a very large experience of ulcerative colitis, states that "the most valuable drug that has been introduced for the treatment of ulcerative colitis in the years that I have been interested in the problem is salicylazosulfapyridine".

In this country the drug has been available only for the past three years, under the name 'Salazopyrin'. Since it seems possible that its use will increase, it is necessary to be aware of its toxic effects. Nausea or vomiting develops in 1 patient in about 5 or 6 treated with salazopyrin. Less common are skin rashes, drug fever, and joint reactions. Serious toxic reactions are said to be rare, the principal one being neutropenia going on to agranulocytosis.

After seeing 2 patients (cases 1 and 2 below) in whom toxic anæmia with Heinz-body formation developed during salazopyrin therapy, we began to make regular examinations for Heinz bodies in all patients receiving the drug, and a further case has since been discovered (case 3).

Technical Methods

Demonstration of Heinz Bodies

Method I (*wet preparation*).—A few drops of blood from a finger-prick are taken into about double their volume of 0·5% methyl-violet in isotonic saline solution. (The stain solution must be filtered before use.) After the blood has stood for a few minutes, a drop of it is examined under a cover-slip with the oil-immersion objective.

Method II (*permanent preparation*).—A few drops of blood from a finger-prick are taken into isotonic saline solution containing 0·5% sodium citrate. The tube is centrifuged until the cells are deposited, and the supernatant fluid is poured off. The red cells are resuspended in isotonic saline solution containing 0·5% methyl-violet. (This solution must be filtered immediately before use.) The tube is centrifuged again, and films are made from the deposited red cells with the least possible delay. These are air-dried and mounted without any counterstain.

By either of the above methods Heinz bodies are shown as darkly stained discrete particles in the almost colourless red cells.

Reticulum is visible as a diffuse violet mottling or speckling.

Other Methods

All other hæmatological techniques used were those recommended by Dacie (1956).

Case-reports

Case 1.—A man, aged 28, was put on salazopyrin therapy on Aug. 23, 1956, for severe ulcerative colitis. He had a past

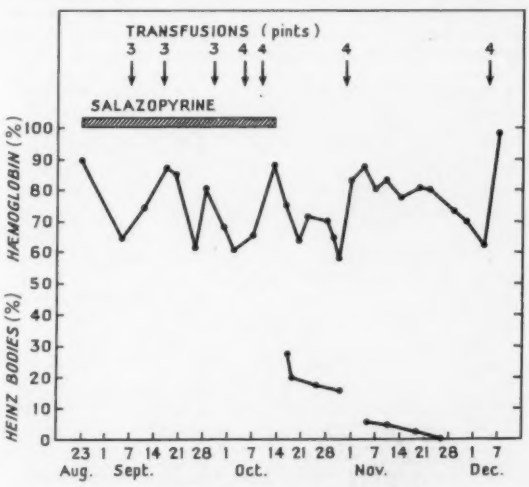

Fig. 1—Treatment and course in case 1.

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TABLE I—MAIN HÆMATOLOGICAL DATA IN CASE 1

Date	Hæmoglobin (%)	Hæmoglobin (g. per 100 ml.)	Reticulocytes (%)	Heinz bodies (%)	White cells (per c.mm.)	Blood transfused (pints)	Other investigations
Aug. 2, 1956	96	14·2	..	..	5600	..	..
Sept. 4, ,,	65	9·6	..	..	..	..	Film: anisocytosis, hypochromia, occasional normoblasts
,, 5, ,,	..	..	..	..	..	3	..
,, 10, ,,	75	11·1	..	..	9500	..	..
,, 15, ,,	..	..	..	..	..	3	..
,, 17, ,,	87	12·9	..	..	..	..	..
,, 22, ,,	63	9·3	..	..	..	..	Film: anisocytosis, hypochromia, polychromasia
,, 26, ,,	..	..	..	..	..	3	..
,, 27, ,,	82	12·1	..	..	..	..	..
Oct. 3, ,,	61	9·0	9·6	..	..	..	Film: anisocytosis, polychromasia, some spherocytes and fragmented cells; Coombs test negative; osmotic fragility normal
,, 5, ,,	..	..	..	..	..	4	..
,, 9, ,,	65	9·6	5·0	..	..	..	..
,, 10, ,,	..	..	..	..	..	4	..
,, 11, ,,	90	13·3	..	..	..	..	..
,, 15, ,,	76	11·2	..	28·8	..	..	..
,, 17, ,,	64	9·5	2·4	20·6	..	..	..
,, 24, ,,	70	10·4	4·0	17·6	..	..	..
,, 30, ,,	58	8·6	3·2	15·8	7700	..	Film: very few spherocytes or fragmented cells
,, 31, ,,	..	..	..	..	..	4	..
Nov. 6, ,,	88	13·0	5·2	4·6	..	..	..
,, 12, ,,	82	12·1	3·6	4·2	..	..	Film: moderate polychromasia only
,, 20, ,,	80	11·8	..	2·8	..	..	..
,, 27, ,,	73	10·8	4·0	Very few	..	..	..
Dec. 4, ,,	63	9·3	6·0	None	..	..	..
,, 6, ,,	..	..	..	..	..	4	..
,, 7, ,,	98	14·5	6·0	..	8500	..	Film: moderate polychromasia
,, 21, ,,	95	14·1	..	None	..	..	..
May 3, 1957	105	15·5	..	..	..	..	Film normal

history of tuberculosis, beginning with a pleural effusion in May, 1949, and ending with antituberculous treatment in 1951 and 1952 for caries of the spine. His first episode of diarrhœa was in January, 1956, lasting only three days, and further episodes occurred in March and in May of the same year. From June, 1956, he had continuous abdominal discomfort and increasingly loose bloodstained motions containing mucus. An inflamed and ulcerated mucosa was seen on sigmoidoscopy. By August, 1956, he was having upwards of twenty-five motions daily and required repeated transfusions to maintain his hæmoglobin.

Salazopyrin therapy was begun on Aug. 23, 1956. The initial dose of 2·0 g. q.d.s. was reduced after five days to 1·0 g. q.d.s. At the same time the patient was given corticotrophin gel 80 units daily for twenty-one days, followed by 40 units daily for twenty-one days, and (because of the history of tuberculosis) intramuscular streptomycin 0·5 g. b.d.

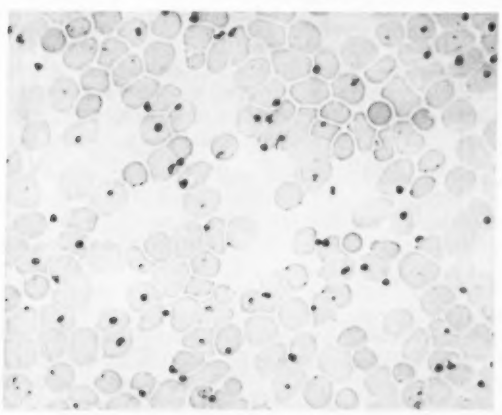

Fig. 2—Blood of case 2 stained supravitally for Heinz bodies.

Hæmatology.—After ten days the patient became less ill, and during the next month the diarrhœa was considerably improved and obvious blood ceased to be present in the stools; but increasingly frequent blood-transfusions were needed to maintain a satisfactory level of hæmoglobin (fig. 1). On Oct. 3, 1956, and again on Oct. 9, 1956, spherocytes and fragmented red cells were seen in blood-films, and the reticulocytes were 9·6% and 5·0%; red-cell fragility and plasma-bilirubin were normal. The Coombs test was negative, and there was no methæmoglobinæmia. On Oct. 13, 1956, the salazopyrin was discontinued because it was thought to be responsible for the anæmia. Heinz bodies were first looked for on Oct. 15, 1956, and were found in 30% of the red cells. Over the next four weeks the percentage of affected red cells diminished steadily and they finally disappeared (fig. 1). The fragmented cells also disappeared, and only two more blood-transfusions were necessary before the patient was discharged from hospital. When last seen the patient was at full work, with hæmoglobin 105%, and symptom-free.

The main hæmatological data are set out in table I.

Case 2.—A woman, aged 65, was treated with salazopyrin for a malabsorption syndrome due to an ileocolic fistula. After having a perforated appendix in 1936 she had several operations for intestinal obstruction, including an anastomosis and a resection of a segment of bowel. In 1942 she began to have diarrhœa with loose bulky offensive stools. From 1947 onwards she was treated for macrocytic anæmia and steatorrhœa.

Salazopyrin therapy.—In November, 1956, the patient was readmitted under Prof. G. W. Pickering. Barium studies showed an ileocolic fistula, and, to reduce bacterial colonisation of the small intestine, salazopyrin was given in a dosage of 2 g. t.d.s., beginning on Dec. 2, 1956.

Hæmatology.—Before salazopyrin was given the patient had a normal blood picture. On Dec. 17, 1956, her hæmoglobin level was 78%, and the reticulocyte-count was 4·5%. The reticulocyte preparation showed large inclusion bodies in 95% of the red cells, and these were shown to be Heinz bodies (fig. 2 shows the appearance next day). A blood film showed much fragmentation and distortion of the red cells. The plasma-bilirubin level was 0·9 mg. per 100 ml., and a little methæmoglobin was found. The fragility of the red cells was normal, and a direct Coombs test was negative.

Salazopyrin was immediately discontinued. The hæmoglobin level, which had fallen to 58% by Dec. 19, 1956, began to rise spontaneously, while the Heinz bodies showed a steady fall (fig. 3). Five weeks after the salazopyrin had been discontinued the blood-picture was normal.

The main hæmatological data are given in table II.

Case 3.—A man, aged 61, was given salazopyrin for ulcerative colitis. On starting medical treatment he was having twenty-five motions daily and had pyrexia and tachycardia.

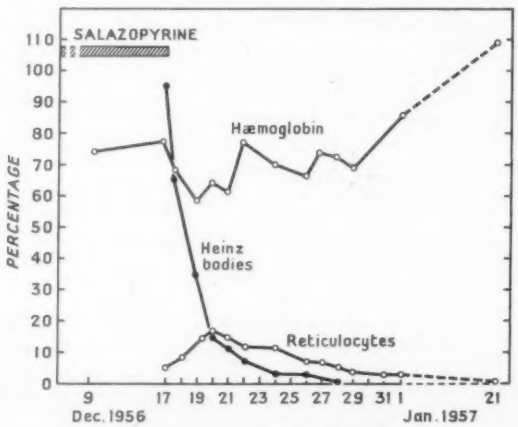

Fig. 3—Treatment and course in case 2.

TABLE II—MAIN HÆMATOLOGICAL DATA IN CASE 2

Date	Hæmoglobin (%)	Hæmoglobin (g. per 100 ml.)	Reticulocytes (%)	Heinz bodies (%)	White cells (per c.mm.)	Other investigations
Nov. 26, 1956	90	13·3	..	..	6500	Film normal
Dec. 9, ,,	76	11·2	..	..	..	..
,, 17, ,,	78	11·5	4·5	95	..	..
,, 18, ,,	67	9·9	9·4	65	..	Film: much fragmentation; plasma-bilirubin 0·9 mg. per 100 ml., methæmoglobin present, osmotic fragility normal, Coombs' test negative
,, 19, ,,	58	8·6	15·4	30	..	..
,, 20, ,,	64	9·5	16·2	16	6250	..
,, 21, ,,	61	9·0	14·5	11	..	Film: moderate fragmentation, much polychromasia
,, 22, ,,	77	11·4	12·8	7	..	..
,, 24, ,,	70	10·4	11·1	3·6	..	..
,, 26, ,,	67	9·9	7·7	1·9	..	..
,, 27, ,,	73	10·8	8·1	1·0	..	..
,, 28, ,,	72	10·7	5·6	0·6	..	Film: very few fragmented cells, slight polychromasia
,, 29, ,,	69	10·2	3·6	Very few		..
,, 31, ,,	87	12·9	2·6	Very few	..	..
Jan. 1, 1957	81	12·0	2·1	None	..	..
,, 21, ,,	108	16·0	Very few	None	3800	Film normal
July 5, ,,	96	14·2	..	None	5000	Film normal

Under treatment with intramuscular corticotrophin gel 80 units daily and blood-transfusions the diarrhœa lessened and the stools no longer contained obvious blood. On Feb. 22, 1957, corticotrophin was withheld and the patient was put on to salazopyrin 1·0 g. q.d.s. He required a blood-transfusion of 4 pints on Feb. 26, and again on March 12, 1957, and March 22, 1957.

Heinz bodies were first found on March 25, 1957, and were present in 26% of the red cells. Salazopyrin was immediately discontinued, and thereafter the percentage of cells containing Heinz bodies decreased steadily, reaching very low levels in a fortnight. No further transfusions were necessary. On discharge from hospital the patient was symptom-free.

The main hæmatological data are set out in table III.

Discussion

With few exceptions the presence of large numbers of Heinz bodies points to chemical poisoning. Among numerous toxic substances which cause Heinz bodies to form are benzene derivatives with amino- or nitro-groups such as phenylhydrazine, phenacetin, and the sulphonamides (Fertman and Fertman 1955). In the last group sulphanilamide and sulphapyridine are particularly active. Probably many of the cases of anæmia reported as being due to sulphonamides (Wood 1938) were of this type; but until the publications of Moeschlin (1940, 1941) the characteristic inclusion bodies were not sought for.

TABLE III—MAIN HÆMATOLOGICAL DATA IN CASE 3

Date	Hæmoglobin (%)	Hæmoglobin (g. per 100 ml.)	Reticulocytes (%)	Heinz bodies (%)	Blood transfused (pints)	Other investigations
Feb. 19, 1957	75	11·1	..	..	..	Film: hypochromia, polychromasia
,, 26, ,,	..	..	..	..	4	..
March 11, ,,	63	9·3	..	None	..	..
,, 12, ,,	..	..	..	..	4	..
,, 18, ,,	77	11·4	..	..	..	..
,, 22, ,,	..	..	..	..	4	..
,, 25, ,,	100	14·8	..	26	..	Film: much fragmentation, some spherocytes
,, 26, ,,	89	13·2	2·4	20·3	..	..
,, 27, ,,	93	13·8	..	18·3	..	..
,, 28, ,,	88	13·0	3·2	14·6	..	..
,, 29, ,,	88	13·0	..	17·3	..	..
,, 30, ,,	90	13·3	..	4·6	..	..
April 1, ,,	86	12·7	2·4	3·3	..	..
,, 2, ,,	90	13·3	..	..	..	..
,, 3, ,,	87	12·9	2·0	9·3	..	..
,, 6, ,,	83	12·3	..	6·0	..	..
,, 8, ,,	77	11·4	1·2	Very few	..	..
,, 16, ,,	85	12·6	2·0	Very few	..	..
June 14, ,,	102	15·1		None	..	Film normal
July 12, ,,	101	14·9	..	..	..	..

In the present three cases salazopyrin was the only drug used which forms Heinz bodies. Withdrawal of the salazopyrin was followed by an immediate fall in the Heinz-body count and an arrest of the hæmolytic anæmia. It therefore seems certain that the anæmia was due to salazopyrin intoxication.

The hæmolytic anæmia associated with Heinz bodies is principally determined by the diminished life-span of the affected red cells. Reported figures for the rate of disappearance of Heinz bodies after cessation of drug treatment lie between four days (Markoff 1943) and thirty days (Gasser 1953). The Heinz bodies in the three present cases had disappeared after forty-nine, eleven, and fourteen days. Possibly the Heinz bodies may be extruded during the life of the red cell; if not, the shape of the disappearance curves indicates either that the affected cells are randomly destroyed or that different cells in the same sample have very different life-spans according to number of Heinz bodies.

The anæmia is probably aggravated by the degradation of hæmoglobin in the affected red cells. Chemical studies and electron-microscopy have shown that Heinz bodies are very dense and contain a large amount of iron (Rozsa and Spicer 1953), and it is generally agreed that they are derived from hæmoglobin. The facts that they can be produced in red blood-cells by numerous chemical agents in vitro and that they are seldom, if ever, found in reticulocytes or in nucleated red cells indicate that the inclusions are formed in vivo in the circulating mature red cells. Methæmoglobinæmia and other abnormal pigments sometimes occur in these anæmias (Dacie 1954), and methæmoglobin was found in case 2.

In view of our experience with these cases we have made it a routine to examine the blood for Heinz bodies in all patients receiving salazopyrin. Since Heinz bodies are invisible in Romanowsky-stained blood-films, it is essential that they should be looked for specially. Hæmolytic anæmia is easily overlooked in a patient with ulcerative colitis who is losing blood. If such a patient is being treated with salazopyrin, the special examination for Heinz bodies provides an easy means of showing when the anæmia is due not to the disease but to the treatment.

Summary

Three cases of Heinz-body anæmia due to the use of salicylazosulphapyridine (' Salazopyrin ') are reported.

The blood of patients treated with salazopyrin and other sulphonamides should be regularly examined for Heinz bodies.

We are grateful to Dr. A. H. T. Robb-Smith, Dr. R. G. Macfarlane, and Prof. L. J. Witts for helpful criticism and to Prof. Sir George Pickering for permission to include case 2.

ADDENDUM

Since this article was written, another case of Heinz-body anæmia has occurred in a patient receiving salicylazosulphapyridine. We have now made regular observations on 32 patients with ulcerative colitis being treated with this drug, so that this case, together with case 3, shows that the complication is fairly common.

References overleaf

SERUM-PROTEINS IN PATIENTS WITH NON-HÆMOLYTIC TRANSFUSION REACTIONS

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THOUGH there are more and more blood-transfusions, hæmolytic reactions are rare, because they are eliminated by adequate compatibility tests; and the perils of contamination are practically excluded by expert preparation and handling of the blood and instruments. On the other hand, troubles are cropping up which we cannot explain: in spite of all precautions some patients react unfavourably to transfusions which are correctly administered. These troubles may arise during or shortly after the transfusion. Most frequently they present with symptoms of fever and allergy—shivering, laboured breathing, cyanosis, low blood-pressure, rashes, and sometimes shock. Such conditions are always distressing and may be dangerous.

Symptoms of this kind are seen chiefly in exhausted patients with hypoproteinæmia or with dysproteinæmia.

MEAN LEVELS OF TOTAL PROTEIN AND OF ELECTROPHORETIC FRACTIONS IN SERUM (G. PER 100 ML.)

Group	No. of persons	Total protein	Albumin	Globulin				A/G ratio
				α_1	α_2	β	γ	
Healthy donors ..	18	7·14	4·02	0·42	0·56	0·79	1·36	1·29
Non-reactors ..	34	7·2	3·46	0·36	0·77	0·74	1·89	1·00
Reactors ..	24	6·2	2·72	0·36	0·67	0·75	1·73	0·88

Such patients can usually be given safely either blood partially freed from plasma, or (better still), washed erythrocytes suspended in saline solution. Dameshek and Neber (1950) described transfusion reactions caused by some constituents of plasma; and Crosby and Stefanini (1952) published similar cases. Possibly, therefore, non-hæmolytic reactions might be induced by the composition of the patient's plasma and/or by that of the transfused blood.

So far no reliable method has been developed by which we can investigate the compatibility of plasma-proteins as a routine in the same way as we test the compatibility of the patient's and donor's plasma and erythrocytes. We take blood for transfusion from " healthy donors " without knowing much about the composition of their plasma-proteins. We still use these proteins in transfusions as we formerly used the erythrocytes of " universal donors," assuming that the composition of the donor's plasma is almost always constant. On the other hand, we know that the recipient's plasma is very often abnormal; and methods in current use make it possible to establish important individual differences in the plasma-proteins of our patients.

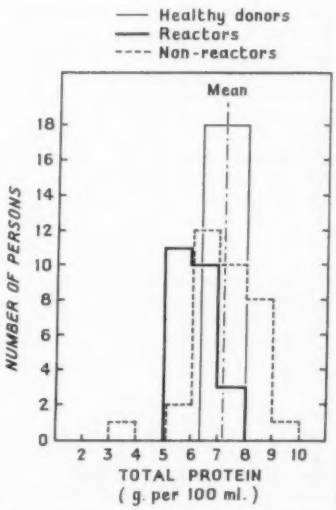

Fig. 1—Distribution of levels of total proteins in serum.

We accordingly investigated the serum-proteins of patients who had had non-hæmolytic reactions to transfusion. We tried to discover (1) whether there were significant differences between the serum-proteins of patients who had reacted and those who had not; (2) whether examination of the serum-proteins of a patient could indicate hypersensitivity to whole blood; and (3) whether such reactions could be avoided by transfusing sensitive patients with blood partially or totally freed from plasma.

Materials and Methods

At our request, hospitals sent us samples of fresh blood from every patient who had reacted unfavourably to a blood-transfusion, as well as from many patients who had not so reacted, together with all available information about the diagnosis, clinical course, and previous blood-transfusions. Serum was taken from these samples and analysed the same morning. All samples which came from patients who had had hæmolytic reactions to transfusion, and all hæmolytic sera, were discarded.

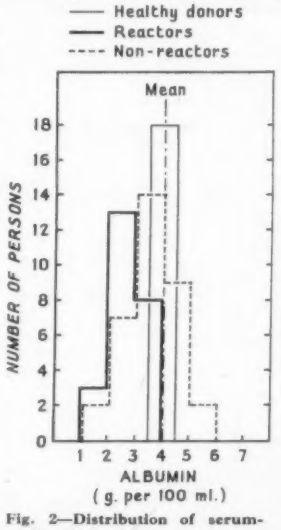

Fig. 2—Distribution of serum-albumin levels.

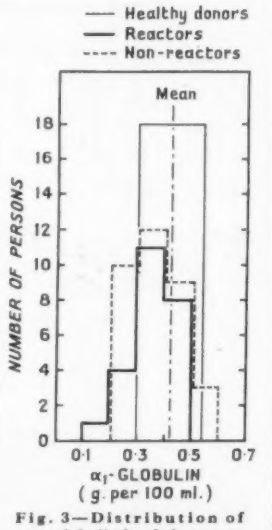

Fig. 3—Distribution of α_1-globulin levels in serum.

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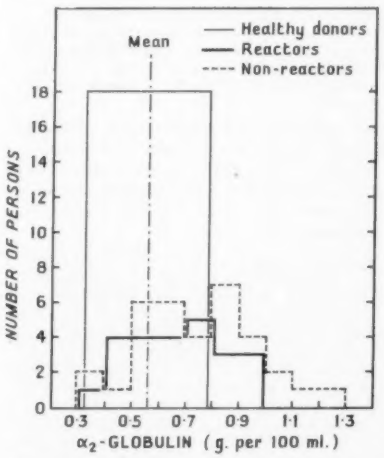

Fig. 4—Distribution of α_2-globulin levels in serum.

Laboratory analysis consisted in determination of total protein by the biuret method of Wolfson et al. (1948) and of paper electrophoresis carried out horizontally in a closed chamber in M/20 phosphate buffer pH 8·9. The dried strips were stained with bromophenol blue and percentages of fractions estimated by cutting out, elution, and photometry. These values were converted into absolute concentrations by multiplication by the factor for total protein.

This procedure was applied to the sera of a random group of healthy blood-donors, a random group of recipients of blood-transfusions who had had no symptoms of reaction, and all those patients whose unfavourable reaction to blood-transfusions could not be ascribed either to faulty matching of blood-groups or factors or to contamination.

Results

The mean levels of total protein and electrophoretic fractions in the serum of healthy donors, patients who had no reactions, and those who had non-hæmolytic reactions are shown in the accompanying table and their distribution in figs. 1–6.

It is evident that, in our groups, non-hæmolytic reactions to blood-transfusions were commoner in patients who had low serum-protein levels, especially low serum-albumin levels. As regards β-globulins, we found no significant difference between recipients who reacted and those who did not. α_2-globulin levels were more often raised in non-reactors than in reactors, whereas α_1-globulin levels were more often subnormal in non-reactors than in reactors.

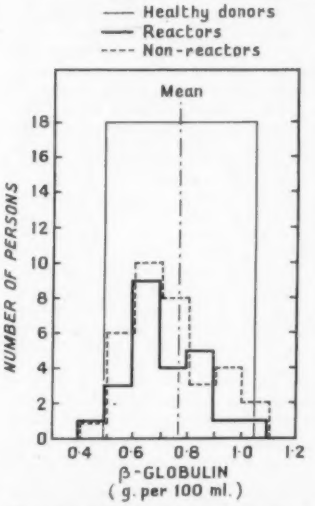

Fig. 5—Distribution of β-globulin levels in serum.

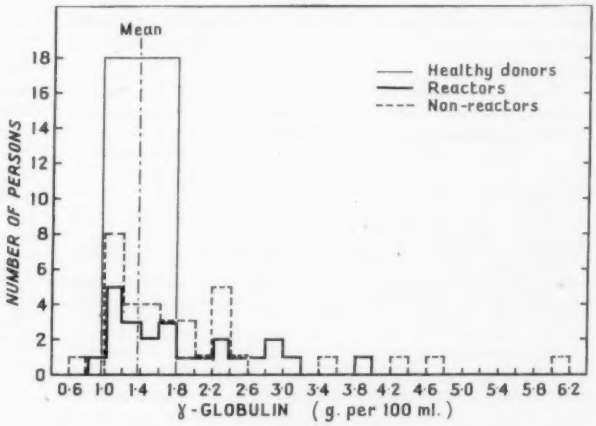
Mean
Healthy donors
Reactors
Non-reactors
NUMBER OF PERSONS
0 2 4 6 8 10 12 14 16 18
0·6 1·0 1·4 1·8 2·2 2·6 3·0 3·4 3·8 4·2 4·6 5·0 5·4 5·8 6·2
γ-GLOBULIN (g. per 100 ml.)

Fig. 6—Distribution of γ-globulin levels in serum.

In both groups some patients had hypergammaglobulinæmia; but, in our experience, hypergammaglobulinæmia does not contribute to the development of transfusion reactions. On the contrary, patients with extreme hypergammaglobulinæmia (2 with kala-azar, 1 with leukæmia, 1 undiagnosed) took blood-transfusions very well.

The albumin/globulin ratio in the serum was in many patients lower than normal; the means (see table) were below normal in both groups of recipients, being lower in the reactors than in the non-reactors. In most cases the low ratio was not due to hyperglobulinæmia but to hypoalbuminæmia.

Conclusions

It seems to us, that, when transfusion is not very urgent, it might be useful to analyse the patient's serum-proteins. Several patients who reacted unfavourably to whole blood took washed erythrocytes very well. These patients had low serum-protein levels, especially a low serum-albumin. Patients with such abnormalities in plasma-proteins should be given blood practically free from plasma. Such blood should always be given to patients who have had a non-hæmolytic reaction to a previous blood-transfusion.

Washed erythrocytes, of course, have not the biological value of whole blood; they can still be useful to a weakened organism. By giving them one can spare the recipient's plasma-proteins, which are used for synthesising hæmoglobin (Whipple 1948).

We claim that this treatment is more physiological than the routine use of antiallergic and other drugs to prevent transfusion reactions.

When we had almost completed our investigation, we found that Wigand (1957), Möller (1957), and Kryger (1957) had also found that non-hæmolytic reactions to blood-transfusion were commoner in patients with abnormal serum-protein levels.

Summary

The serum levels of total protein and electrophoretic protein fractions were estimated (a) in patients who had had (non-hæmolytic) reactions to blood-transfusion; (2) in healthy blood-donors, and (3) in patients who had taken blood-transfusion well.

Subnormal total-protein levels—and especially a low serum-albumin—were found most often in the patients who had reacted badly to blood-transfusion.

It is recommended that, in non-urgent cases the patient's serum-proteins should be determined before transfusion.

Where the serum-protein, and especially the serum-albumin, is low, the patient should be given washed erythrocytes instead of whole blood.

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TOTAL GASTRECTOMY FOR BENIGN PEPTIC ULCER

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TOTAL gastrectomy is rightly regarded as a serious undertaking and is usually reserved for treating carcinoma of the stomach. Balint et al. (1957) suggest, however, that total gastrectomy "should be done in any patient in whom anastomotic ulcers continue to recur after adequate vagotomy and partial gastrectomy." Their 3 patients who underwent total gastrectomy had moderately good health afterwards.

We review here the experience of 12 patients who underwent total gastrectomy for benign peptic ulcer at the Central Middlesex Hospital.

Case 1.—A man, aged 42, was admitted on Oct. 11, 1951, with nine years' history of typical ulcer dyspepsia, which had become more severe for eight months before admission, with nausea, vomiting, anorexia, and a loss of weight of 21 lb. A barium meal showed an apparently malignant ulcer on the lesser curve of the stomach and involving the antrum. At gastroscopy, however, the ulcer appeared to be simple. At operation on Nov. 24, 1951, an extensive ulcer in the middle third of the lesser curve was found, with many enlarged glands. The appearances suggested carcinoma, and a total gastrectomy with end-to-end œsophago-duodenostomy (fig. 1) was done. Histological examination proved the ulcer to be benign.

Postoperative progress.—The patient's preoperative weight of 8 st. 13 lb. had decreased to 7 st. 8 lb. when he was discharged from hospital. After this he gained weight despite the fact that, on radiological examination, barium reached the terminal ileum five minutes after it had been swallowed. In August, 1952, he weighed 7 st. 11 lb. He continued to gain weight and by February, 1953, had reached 8 st. 2 lb. and could eat a good diet. His weight remained steady until February, 1956, when it decreased to 7 st. 12 lb. and a small lesion was noted in his right lung but was thought to be quiescent. By January, 1957, his weight had decreased to 6 st. 2 lb. and tubercle bacilli were found in his sputum. He is still receiving antituberculous chemotherapy and is responding slowly. Treatment is complicated by the development of streptomycin sensitivity. His hæmoglobin is 82%.

Summary.—A man, aged 42, underwent total gastrectomy with œsophago-duodenal anastomosis for what was histologically proved to be a benign ulcer. His subsequent course was satisfactory, with gain in weight and a fair appetite, until the development of pulmonary tuberculosis four years and four months after the operation.

Case 2.—A woman, aged 47, had a severe hæmatemesis from a duodenal ulcer in 1946. A Polya-type partial gastrectomy was done in 1947 because of continuing ulcer pain. Her symptoms soon returned, and an anastomotic ulcer was found radiologically in 1948. In March, 1950, laparotomy was done after a further hæmatemesis, when an anastomotic ulcer and a pancreatic adenoma were found. No resection was done at this operation, but in October, 1950, the patient was admitted with a view to a further partial gastrectomy for severe ulcer pain, but she developed a volvulus of the cæcum and underwent a right hemicolectomy, and the partial gastrectomy was done later. She had to be readmitted after a hæmatemesis in June, 1951, when another anastomotic ulcer was found. She was treated medically. A melæna in April, 1952, was treated at home, but in September, 1953, admission to hospital was again necessary because of severe hæmatemesis. A total gastrectomy was done with an œsophageal anastomosis to the side of a Roux loop of jejunum (fig. 5). The patient was discharged after a stormy convalescence due to a subphrenic abscess in December, 1953. In May, 1951, she weighed 8 st. 13 lb. In March, 1954, six months after the total gastrectomy, she weighed 8 st. but was eating well and her bowels were regular. In March, 1956, she weighed 7 st. 7 lb. but was well, with regular bowel actions and a good appetite. She has remained well since, with no further loss of weight.

Summary.—This woman had a total gastrectomy with Roux-en-Y reconstruction for recurrent anastomotic ulceration. Four years later she was well but had lost 20 lb. in weight in three years. Her weight has not changed since. Her hæmoglobin is 90%, and she is doing her housework.

Case 3.—A man, aged 31, had a Polya-type partial gastrectomy in 1941 for duodenal ulcer of five years' standing. Ulcer symptoms returned in 1943, and he had periods of medical treatment in 1943, 1944, and 1949. In September, 1952, a further Polya-type gastrectomy was done for anastomotic ulceration. Three months later ulcer symptoms returned once more with some loss of weight, and in September, 1953, a total gastrectomy, with an end-to-side œsophago-jejunostomy and a side-to-side entero-enterostomy between afferent and efferent loops (fig. 3), was done for a large anastomotic ulcer. The patient made an uneventful recovery. In November, 1952, after the second partial gastrectomy, he weighed 10 st. 5 lb. and in September, 1953, 10 st. 3 lb. In January, 1954, four months after the total gastrectomy he weighed 9 st. 5 lb. and had a fair appetite but was troubled by heartburn, bilious vomiting, and dysphagia. A barium meal, however, showed a normally functioning anastomosis. His symptoms remained unchanged, but he continued to lose weight until March, 1956, when he weighed 8 st. 10lb. Revision of the anastomosis was considered at this time, but it was thought that the symptoms did not warrant the risks involved. When last seen in August, 1957, four years after the total gastrectomy,

Fig. 1—End-to-end œsophago-duodenal anastomosis.

Fig. 2—Jejunal-loop replacement with œsophago-jejunal and jejuno-duodenal anastomoses.

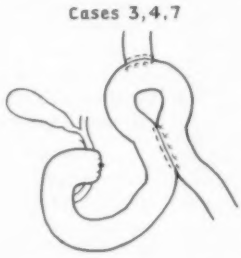

Fig. 3—End-to-side œsophago-jejunal anastomosis with side-to-side jejuno-jejunostomy.

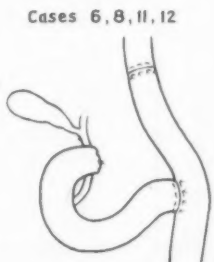

Fig. 4—Roux-en-Y reconstruction with end-to-end œsophago-jejunal anastomosis.

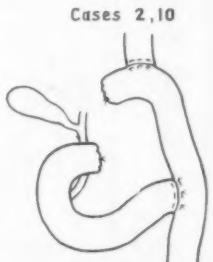

Fig. 5—Roux-en-Y reconstruction with end-to-side œsophago-jejunal anastomosis.

the patient still had heartburn, bilious vomiting, and a poor appetite, but his weight was steady at 8 st. 10 lb. His hæmoglobin was 89%. He is at work.

Summary.—This man had recurrent anastomotic ulceration following a Polya-type partial gastrectomy for duodenal ulcer; it recurred after a further gastrectomy. Total gastrectomy, with an end-to-side œsophago-jejunal anastomosis and a side-to-side entero-enterostomy between afferent and efferent loops, was done four years ago. He has lost 23 lb. and is troubled by heartburn, bilious vomiting, and a poor appetite but he is able to work.

Case 4.—A man, aged 52, presented in December, 1953, with eighteen months' history of loss of weight (3 st.), epigastric discomfort, and anorexia. A barium meal showed deformity of the pyloric antrum suggesting carcinoma. At operation the antrum was found to be indurated and the subpyloric glands enlarged and hard. A total gastrectomy, with end-to-side œsophago-jejunostomy and side-to-side entero-enterostomy between afferent and efferent loops (fig. 3), was done. The patient made an uneventful recovery. Histological examination of the resected stomach and glands revealed no evidence of malignancy. In October, 1953, two months before the operation, he weighed 12 st. 9 lb. By March, 1954, six months later, his weight had decreased to 11 st. 12 lb., his appetite was poor, and he complained of bilious regurgitation and dysphagia. A barium meal, however, showed no hold-up. By August, 1954, there was some improvement in appetite and energy, but the bilious regurgitation persisted, and he had lost another 3 lb. in weight. He was last seen in June, 1955, eighteen months after the total gastrectomy, when his condition was unchanged. His hæmoglobin was 92%. He could not be traced in November, 1956, having moved from London.

Summary.—This patient had a total gastrectomy, with an end-to-side œsophago-jejunal anastomosis and side-to-side entero-enterostomy between afferent and efferent loops, on the mistaken radiological and operative diagnosis of carcinoma of the pyloric antrum. After this he lost 14 lb. in weight and has had troublesome bilious vomiting.

Case 5.—A married woman, aged 71, was admitted in December, 1953, with severe ulcer dyspepsia and melæna. She had had previous bouts of ulcer dyspepsia in 1913, 1943, 1951, and 1952. Gastroscopy showed an hour-glass deformity of the stomach and three gastric ulcers. A barium meal was reported as showing a single ulcer. At operation the appearances were those of a gastric carcinoma, and a total gastrectomy with an end-to-end œsophago-duodenostomy (fig. 1) was done. The postoperative course was uneventful. Histologically the gastric ulcer was benign, but a leiomyoma was also found near by Before the operation the patient weighed 7 st. 6 lb.; three months later, in March, 1954, she weighed 7 st. 3 lb., could eat normal meals, and was feeling well, and her bowels were regular. She had palpitations and faintness sometimes, mainly after sweet foods. Since then she has improved steadily, with increasing appetite, energy, and weight, and fewer dumping symptoms. When last seen in May, 1957, she weighed 7 st. 13 lb., could eat anything, and had regular actions of her bowels. Her hæmoglobin was 84%.

Summary.—This old lady had a total gastrectomy with an end-to-end œsophago-duodenostomy because of the operative diagnosis of gastric carcinoma, which was proved to be erroneous. She has gained 10 lb. in weight since the operation and is in excellent health three and a half years later.

Case 6.—A man, aged 47, underwent partial gastrectomy for a duodenal ulcer of ten years' standing. Ulcer pain recurred a year later, and he lost a great deal of weight in the next three years. In January, 1954, a barium meal showed a large anastomotic ulcer; so a total gastrectomy with a Roux-en-Y œsophago-jejunal reconstruction (fig. 4) was done. His postoperative course was marred by a wound infection, but he made a good recovery. Before the original partial gastrectomy he weighed 10 st., but by October, 1953, his weight had decreased to 9 st. 5 lb. After the total gastrectomy he lost weight despite a good appetite and regular bowel actions. He reached his lowest weight—8 st. 12 lb.—in July, 1954, but since then he has gained weight and when last seen in April, 1957, he weighed 9 st. 3 lb. He was then well, with a good appetite and energy, occasional bulky stools, and a mild iron-deficiency anæmia (Hb 80%).

Summary.—This man, aged 51, had a total gastrectomy with a Roux-en-Y reconstruction in January, 1954, for anastomotic ulcer. Three years later he is well, with a good appetite and energy. His weight is almost the same as before total gastrectomy.

Case 7.—A boy, aged 15, had duodenal-ulcer dyspepsia in 1940. He had a perforation and hæmatemesis in 1942, while in the Merchant Navy; a partial gastrectomy was done in 1948; a further gastrectomy, with a vagotomy, was done in 1950 for anastomatic ulcer. He was treated medically in 1952 for another anastomotic ulcer, and in 1953 a gastrocolic fistula was repaired. A further vagotomy was attempted in 1954, but later that year a further gastric resection was necessary. Within a few months the patient had his sixth anastomotic ulcer, and a total gastrectomy, with end-to-side œsophago-jejunostomy and side-to-side entero-enterostomy between the afferent and efferent loops (fig. 3), was done in February, 1955. Convalescence was complicated by an empyema, which resolved with conservative treatment. In 1950, at the time of his third gastrectomy, he weighed 7 st. 5 lb. After the repair of the gastrocolic fistula his weight fell to 6 st. 9 lb. At this time he had very severe steatorrhœa, which persisted after the total gastrectomy, his weight two months later being only 6 st. Since then, however, his condition has improved slowly, and when last seen in January, 1957, two years after the total gastrectomy, he was regaining some appetite and his weight had increased to 8 st. 2 lb. He is still troubled by steatorrhœa, but this can be controlled partially by aureomycin.

Summary.—This young man had his first partial gastrectomy at the age of 23. After further resections and vagotomy had failed to prevent the recurrence of ulcers, the sixth recurrence was treated by total gastrectomy, the œsophagus being anastomosed to the side of a jejunal loop, with entero-enterostomy between afferent and efferent loops. Severe steatorrhœa persisted after this operation, but the patient has managed to gain weight.

Case 8.—A man, aged 38, had melæna in 1917. He was operated on in 1924 at another hospital and again in 1929 for further hæmorrhages. He had twelve further attacks of melæna up to 1943, when, after yet another severe melæna, a Polya-type partial gastrectomy was done for duodenal ulcer. In the next twelve years the patient had sixteen more episodes of gastrointestinal hæmorrhage. He had never had ulcer pain. He had always bled profusely from cuts, but a full investigation of his blood by Dr. J. V. Dacie revealed no abnormality. By the time he was referred to the Central Middlesex Hospital in March, 1955, he had had 200 bottles of blood by transfusion. At this time a total gastrectomy with a Roux-en-Y reconstruction (fig. 4) was done for a large anastomotic ulcer. He made a good recovery. In November, 1956, eighteen months after the total gastrectomy, his general practitioner reported: " I think he could eat a larger meal than I." He was gaining weight and at work. In November, 1957, he wrote: " I feel very fit and in the best of health. My weight is nearly 12 st. With regard to food, I can eat anything, usually four good meals a day."

Summary.—This patient had recurrent gastrointestinal hæmorrhages between 1917 and 1955 and received 200 pints of blood by transfusion. The hæmorrhages continued despite three gastric operations, the last a Polya-type partial gastrectomy. A total gastrectomy with a Roux-en-Y reconstruction was done in March, 1955, and in November, 1957, the patient is in excellent health.

Case 9.—A man, aged 32, was seen in 1946 with four years' history of ulcer dyspepsia. A barium meal confirmed the diagnosis of duodenal ulceration. The ulcer perforated in 1950 and was treated by suture. In August, 1951, a Polya-type partial gastrectomy was done, but, because of continuing loss of weight, was refashioned to a jejunal-loop replacement gastrectomy in January, 1952. In February, 1953, streptococcal liver abscess developed and required surgical drainage. In March, 1954, ulcer pain returned, and an anastomotic ulcer was found in the jejunal segment. This was resected and a Billroth-I anastomosis made. While the patient was still in hospital another anastomotic ulcer developed, and a vagotomy was done but failed to cure the ulcer, which persisted despite medical treatment. In April, 1955, a total gastrectomy, with a jejunal segment replacement (œsophago-jejuno-duodenal anastomosis) was done (fig. 2). Postoperative convalescence was uneventful. Before the first partial gastrectomy this patient weighed 9 st. 6 lb., and just before the total gastrectomy, despite his stormy career, 9 st. 2 lb. Six months later his weight was 8 st. 8 lb. and it has remained unchanged since. When last seen in August, 1957, he was still complaining of epigastric fullness after meals and some pain and nausea. He has mild steatorrhœa, but his hæmoglobin is 92%.

Summary.—This man had an unsuccessful Polya partial gastrectomy in August, 1951. Conversion to a jejunal-loop replacement gastrectomy was followed by recurrent anastomotic ulceration, which was not cured by conversion to a Billroth-I

SUMMARY OF DATA OF 12 PATIENTS TREATED BY TOTAL GASTRECTOMY FOR BENIGN PEPTIC ULCER

Case no.	Sex	Age at T.G. (yr.)	Reason for T.G.	Type of reconstruction	Weight before T.G. (lb.)	Weight at F.U. (lb.)	Length of F.U. (ms.)	Results
2	F	54	A.U.	Roux-en-Y	125	105	50	Good
6	M	51	A.U.	Roux-en-Y	129	128	39	Very good
8	M	56	A.U.	Roux-en-Y	Not known	Increasing	32	Very good
10	F	34	A.U.	Roux-en-Y	87	98	31	Fair (pain in thoracotomy scar)
11	M	54	A.U.	Roux-en-Y	Not known	Not known	21	Very good
12	M	49	A.U.	Roux-en-Y	150	149	20	Very good
1	M	48	G.U.	Œsophago-duodenal anastomosis	125	87	74	Poor (pulm. tuberculosis)
5	F	71	G.U.	Œsophago-duodenal anastomosis	104	111	41	Very good
3	M	45	A.U.	Loop reconstruction with lateral entero-anastomosis	143	122	48	Poor
4	M	52	G.U.	Loop reconstruction with lateral entero-anastomosis	177	162	18	Fair
7	M	31	A.U.	Loop reconstruction with lateral entero-anastomosis	93	114	24	Fair (steatorrhœa)
9	M	47	A.U.	Jejunal replacement œsophago-jejuno-duodenal anastomosis	128	120	28	Fair

A.U., anastomotic ulcer F.U., follow-up G.U., gastric ulcer T.G., total gastrectomy

reconstruction or by vagotomy. In April, 1955, total gastrectomy with a jejunal-loop replacement was done. The result has been only moderately good.

Case 10.—A married woman, aged 23, began to have ulcer symptoms in 1944 and shortly afterwards a duodenal ulcer perforated and was sutured. By May, 1950, pyloric stenosis had developed, and a gastroenterostomy was done. Eighteen months later ulcer symptoms recurred, and an anastomotic ulcer was found in August, 1953, and was treated by a Polya-type partial gastrectomy. Ulcer pain recurred again within three months, but no anastomotic ulcer was found. The patient was referred to the Central Middlesex Hospital in April, 1955, and a barium meal now showed an anastomotic ulcer. Total gastrectomy with a Roux-en-Y reconstruction (fig. 5) was done. Postoperative convalescence was uneventful. We have no record of her earlier weight, but two months after the total gastrectomy she weighed 6 st. 4 lb. She then complained of retrosternal discomfort after meals but was otherwise well. In January, 1956, nine months after her operation, she was readmitted with retrosternal pain radiating to her shoulders. Physical examination, barium meal, and œsophagoscopy were unrevealing. In December, 1956, she weighed 6 st. 8 lb., still had some pain, and had iron-deficiency anæmia (Hb 72%). In November, 1957, her general practitioner reported that she now weighed 7 st., her appetite was fair, and her hæmoglobin was 90%. He wrote: " Having had so much trouble in the past, she finds it difficult to believe she has not another ulcer." She is doing her housework.

Summary.—This young woman had an unsuccessful gastroenterostomy for a duodenal ulcer with pyloric stenosis in 1950. A Polya-type partial gastrectomy was done in 1953 for anastomotic ulceration. This recurred, and in April, 1955, total gastrectomy with a Roux-en-Y gastrectomy was done. She still complains of chest pain but has gained weight and has a fair appetite.

Case 11.—A man, aged 30, began to have ulcer dyspepsia in 1931. In 1933 he had a gastroenterostomy for duodenal ulcer. The ulcer pain returned twelve years later, and in 1945 a further operation was done. In 1947 and in 1949 further anastomotic ulcers were excised, and in 1951 a vagotomy was done for yet another ulcer. In 1953 a further ulcer caused a hæmatemesis, which was treated medically, and in April, 1955, a large anastomotic ulcer, adherent to the eighth rib anteriorly, was excised. In November, 1955, the patient was referred to the Central Middlesex Hospital, where a barium meal showed a large stomal ulcer. He was readmitted in January, 1956, and total gastrectomy with a Roux-en-Y reconstruction (fig. 4) was done. His postoperative course was uneventful. In November, 1957, twenty-two months after the total gastrectomy, his general practitioner reported that the patient had given up using pethidine, had an excellent appetite, and was gaining weight. The doctor wrote: " He is absolutely marvellous compared to the old days. . . . I am most impressed with this case as the transformation is astonishing."

Summary.—This man had a series of anastomotic ulcers excised and vagotomy done after an initial gastroenterostomy for duodenal ulcer. Total gastrectomy in January, 1955, with Roux-en-Y reconstruction has given a very good result, judged twenty months later.

Case 12.—A man, aged 27, began to have ulcer dyspepsia in 1934. A perforation of a duodenal ulcer followed in 1939. In 1943 a Polya-type partial gastrectomy was done. In 1944, 1947, and 1951 he had perforations of anastomotic ulcers treated by suture. He continued to have ulcer pain for the next two years and had melæna in 1952. After this he was well for two years, but in September, 1955, he was admitted with a perforated anastomotic ulcer and had a subtotal Polya-type gastrectomy. In December, 1955, he had another anastomotic ulcer. He was admitted in February, 1956, and underwent total gastrectomy with a Roux-en-Y reconstruction (fig. 4). His postoperative convalescence was uneventful. In April, 1955, during a period of relatively good health, he weighed 10 st. 10 lb. In April, 1956, two months after the total gastrectomy, he complained of heartburn at night but was able to eat a full meal. He was troubled by constipation, for which he took ' Senokot '. His weight was 10 st. 1 lb. By June, 1956, he was back at work, and when last seen in November, 1957, twenty months after his total gastrectomy, he was very well, could eat anything, and weighed 10 st. 9 lb. He said: " Why did you not do this operation ten years ago ?"

Summary.—This man had a series of anastomotic ulcers following a Polya-type partial gastrectomy in 1943. In September, 1955, a subtotal gastrectomy was done for yet another perforated anastomotic ulcer, but two months later anastomotic ulceration had recurred, and in February, 1956, total gastrectomy with a Roux-en-Y reconstruction was done, with very good results.

Conclusions

No total gastrectomy for benign ulcer was done at the Central Middlesex Hospital before 1951. Since then 12 patients have had this operation for benign ulcer, and all have survived. In 9 patients the operation was done for recurrent anastomotic ulceration; in the remaining 3 patients the lesion was a gastric ulcer, mistaken for carcinoma at operation.

The accompanying table summarises the results obtained in these 12 patients. There is no doubt that those patients who had the Roux-en-Y reconstruction have had the best results. Of these 6 patients (cases 2, 6, 8, and 10–12), all operated on for anastomotic ulcer, 4 are very well, eating normal meals, and leading normal lives twenty to thirty-nine months after the operation. 1 other patient is well but has lost 20 lb. in weight, but other factors may be partly responsible, and the remaining 1 is well in every way but continues to be troubled by pain in the thoracotomy scar. 3 patients (cases 3, 4, and 7) have had loop reconstructions with lateral entero-anastomosis; none of these has been really successful, though they are able to work. 1 has severe steatorrhœa, present even before total gastrectomy, but has managed to gain weight with the aid of aureomycin. The 2 others have lost weight and are troubled by bilious vomiting and heartburn. Direct œsophago-duodenal anastomoses were done for 2 patients (cases 1 and 5), with excellent results in 1. The other patient has no dyspeptic symptoms but has contracted severe pulmonary tuberculosis four years and four months after the operation.

The creation of an artificial gastric reservoir from a jejunal loop has not been a success in the 1 case where this was done (case 9). These results agree with the experience with patients undergoing total gastrectomy

for carcinoma at the Central Middlesex Hospital. Brintnall et al. (1956), on the basis of a careful analysis of 58 patients with total gastrectomy mainly for carcinoma, also concluded that the Roux-en-Y reconstruction (24 patients) gave the best results. They too were disappointed with the results of direct œsophago-duodenal anastomosis (3 cases), mainly because of loss of weight and bilious regurgitation. They found that iron was the only factor required in larger than normal amounts in their patients.

All our patients have had regular doses of intramuscular vitamin B_{12}, and no instance of macrocytic anæmia has been found among them. Iron-deficiency anæmia, however, is liable to occur, and we agree with Brintnall et al. (1956) that these patients need additional oral iron, in the same way as do patients who have undergone partial gastrectomy.

From our experience with these 12 patients we feel that total gastrectomy, if done with a Roux-en-Y reconstruction, is a justifiable operation for patients with anastomotic ulceration not cured by an adequate partial gastrectomy and vagotomy, and even in patients with simple gastric ulcer in whom, at operation, the findings strongly suggest malignancy and in whom subtotal resection would not have given sufficient clearance. Adequate maintenance doses of vitamin B_{12} and oral iron are essential for the well-being of these patients. In our experience the nutrition of patients with Roux-en-Y reconstructions is entirely satisfactory. They can eat a normal amount of food and can maintain their weight.

Summary

The case histories of 12 patients who have had total gastrectomy for benign peptic ulcer are presented.

The Roux-en-Y reconstruction gives satisfactory results and is to be preferred to other methods of reconstruction. The operation is justified in patients with obstinate anastomotic ulceration not arrested by adequate gastrectomy and vagotomy.

The nutrition of patients with the Roux-en-Y reconstruction is satisfactory. They must, however, be given regular maintenance doses of vitamin B_{12} and oral iron.

These patients were all admitted to the Gastroenterological Unit of the Central Middlesex Hospital under the care of Dr. F. Avery Jones, to whom we are indebted. We also wish to thank our colleagues, Mr. T. G. I. James, Mr. F. A. Henley, and Mr. H. Hashemian.

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URICOSURIC EFFECT OF DICOUMAROL

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SINCE dicoumarol was introduced about fifteen years ago into therapy by Butt et al. (1941) and Lehmann (1942) it has been increasingly used prophylactically and therapeutically in conditions connected with thromboembolism. The attention of pharmacologists and clinicians has been focused on its effect on clotting of the blood by hampering the formation of proconvertin and prothrombin in the liver. Some workers look on this as its sole pharmacological action (Møller 1955, Goodman and Gilman 1955); but this standpoint is no longer tenable.

Sougin-Mibashan and Horwitz (1955) investigated the effect of 'Tromexan' (ethylbiscoumacetate) on the metabolism of uric acid in the rat, the dalmatian dog, and man, using Brown's colorimetric method for determining the uric acid (Kolmer and Boerner 1945). After a single dose of tromexan 1·2–1·8 g. by mouth they found a pronounced fall in the level of uric acid in the serum and a significant rise in the ratio of uric-acid clearance to creatinine clearance.

We have investigated whether dicoumarol produces similar effects. We estimated the uric acid in both serum and urine by enzymatic spectrophotometry by the method of Prætorius (1949) modified by Prætorius and Poulsen (1953). All the determinations were made as double determinations, the deviations from the average rarely exceeding ±3%.

TABLE I—SERUM URIC-ACID LEVELS (MG. PER 100 ML.) IN SERUM BEFORE AND AFTER DICOUMAROL IN HEALTHY PERSONS

	Person no.				
	1	2	3	4	5
Before	5·3	4·9	5·4	4·1	6·1
After	3·7	4·4	4·4	3·4	5·0
% fall	30	10	19	17	18

Material and Method

The levels of uric acid in the serum were determined in 40 patients before and during anticoagulant treatment: 27 patients had myocardial infarction; in 9 patients this disease was suspected; 3 had pulmonary embolism; and 1 had undergone a bypass operation on a femoral artery.

The anticoagulant treatment was given according to principles described by Holten (1955). Initially a dose of 500–750 mg. of dicoumarol was given, after which dicoumarol was withheld for two or three days. The next dose depended on the effect of the initial dose on the prothrombin time, and the daily maintenance dosage was adapted according to daily determinations of the prothrombin time. During the first two days after the start of treatment intramuscular long-acting heparin 15,000–20,000 I.U. was injected at intervals of eight hours.

To determine the effect of dicoumarol on the uric-acid level in the serum under comparable conditions we chose as standard the first fasting sample taken and related this to the lowest level of uric acid in the serum after the initial dose of dicoumarol.

Results

In the vast majority of cases the level falls. During treatment with the maintenance dosage of dicoumarol the uric-acid level in the serum rises again to a fairly constant value, which in almost all cases is lower than that of the first fasting sample.

The average fall was 1·8±0·2 mg. per 100 ml. In 31 patients—i.e., more than 75%—the level of uric acid in the serum fell more than 20%; in 4 patients it fell 10–20%; and in 5 patients no significant change was observed. The possibility that this fall might be due to the myocardial infarction or to the heparin was investigated by determining the level of uric acid in the serum before and after a dose of 500–700 mg. of dicoumarol in 5 healthy persons (table I).

The uric-acid levels in the serum were determined at least thrice during the first twenty-four hours after the administration of dicoumarol and subsequently daily for three to seven days. In table I the lowest levels after dicoumarol are given; these were usually found twenty-four hours after the administration of dicoumarol.

TABLE II—SERUM LEVELS, EXCRETION, AND CLEARANCE OF URIC ACID AND CLEARANCE OF CREATININE

Person no.	Day no.	Uric acid in serum (mg. per 100 ml.)	Urinary excretion of uric acid (mg. per 24 hr.)	Clearance (ml. per min.)	
				Uric acid	Creatinine
4	1	4·1	714	11·4	161
	2	4·0	777	11·7	107
	3	4·1	944	15·2	132*
	4	3·8	860	15·4	126
	5	3·4	691		118
	% difference	−17	+27	+31	
5	1	6·1			100
	2	5·7	426	4·9	70
	3	5·2	482	5·8	70
	4	4·9	445	4·6	65
	5	5·7	625	7·4	67*
	6	5·0	621	7·0	104
	7	5·2	517		
	% difference	−18	+39	+45	

* Dicoumarol 500 mg. was given after fasting blood-samples had been drawn at the beginning of days 3 and 5.

In 2 of the healthy persons (nos. 4 and 5) the urinary excretion of uric acid in twenty-four hours was determined for several days; simultaneously the clearance of endogenous creatinine was determined. The results are given in table II.

Discussion

These results show that dicoumarol increases the urinary excretion of uric acid and decreases the level of uric acid in the serum. It is generally believed that uric acid is freely filtered in the glomeruli, and that about 90% of the uric acid filtered is reabsorbed in the tubules. Since the clearance of creatinine is not changed while that of uric acid increases after the administration of dicoumarol, dicoumarol probably decreases the tubular reabsorption of uric acid.

The well-known uricosuric drugs have similar actions. This has been shown for probenecid by Gutman and Yü (1951), for salicylic acid by Crone and Lassen (1955) and for tromexan by Sougin-Mibashan and Horwitz (1955).

This uricosuric effect of the coumarin derivatives is of interest in connection with the significance of the level of uric acid in the serum in the pathogenesis of atherosclerosis. Huchard (1899) compared the changes in the arteries in uric arthritis with the changes in the heart in rheumatic fever, and Roberts (1900) mentioned the significance of "uric-acid diathesis" for the development of thromboembolic processes. Gertler and White (1954) mention the possible significance of uric acid in the serum as a harmful agent causing deposition of cholesterol. The question arises: do the coumarin derivatives improve the prognosis of myocardial infarction solely by their anticoagulant effect, or is their uricosuric effect also important? At any rate it is well established that the effect on clotting is not the only effect of the coumarin derivatives.

Summary

In 40 patients with myocardial infarction and other thromboembolic conditions dicoumarol in initial doses of 500–750 mg. caused an average decrease of 1·8 ± 0·2 mg. per 100 ml. in the level of uric acid in the serum. On maintenance doses of dicoumarol this level rose a little but not to its pre-treatment value.

In experiments on healthy volunteers dicoumarol caused a significant fall in the level of uric acid in the serum and increased urinary excretion of uric acid, probably because dicoumarol hampers tubular reabsorption.

References at foot of next column

FRACTURES OF THE PARIETAL BONE IN CHILDREN

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SURGEON-IN-CHARGE, CASUALTY DEPARTMENT, GENERAL INFIRMARY, LEEDS

THERE is a type of fracture of the parietal bone in children with distinctive clinical features. In 1955–57 twelve such cases were seen in the casualty department of the General Infirmary at Leeds, in which 38,000 new cases annually are treated.

Clinical Picture

An anxious parent brings to the casualty department a small child with a lump on the side of its head and a history of a fall on to its head some days previously. After the initial upset the child went on eating, sleeping, and playing as before. The parent found nothing wrong with the head shortly after the fall but discovered some days later (in this series 1–14 days) a lump on the side of the head. In the casualty department the child is found to be perfectly healthy with no physical signs except the lump.

The lump has special characteristics. In some children rather long hair over it makes it difficult to see without careful scrutiny. Palpation, however, reveals a soft cystic swelling on one side of the head and of appreciable size—usually 3 or 4 inches in diameter. It is roughly circular and not bounded by any of the suture lines of the skull. Its edge is fairly easy to define but not clearcut. There is no bruising in the overlying skin or superficial fascia. The swelling is uniformly soft and bears no resemblance to the ordinary hæmatoma of the scalp, with its soft centre and firm edge.

Diagnosis

A fracture of the underlying parietal bone can be confidently diagnosed on the physical characteristics of the swelling alone. In ten of these cases immediate radiography revealed a linear fracture of the parietal bone, sometimes running into the neighbouring bones. The size of the fracture bore no relation to the size of the swelling. In one case, however, radiography two days after the injury, and again three days after, showed no fracture, but fourteen days later revealed the fracture line very clearly. These eleven patients were aged from 6 months to 3 years. The twelfth case was in a boy, aged 9 years, in whom radiography at his first attendance and twice subsequently, revealed no fracture, but nevertheless the clinical features and characteristics of the swelling were typical.

Course

The courses of these cases were very similar. The child remained perfectly well. The swelling remained

DR. HANSEN, DR. HOLTEN: REFERENCES

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unchanged in size for some days and then relatively abruptly began to disappear: it shrank in size, diameter, and depth, but its consistence remained unchanged. In a few days the swelling completely disappeared, leaving no trace. In the eleven cases in which a fracture was demonstrated radiographically the swelling disappeared 12–21 days after it had appeared. In the boy aged 9 years the swelling took 32 days to disappear. In eleven of these twelve patients there were no further symptoms. The twelfth patient, a boy aged 18 months, returned four months later with a history of four days' swelling in the same site, of apparently spontaneous origin. Radiography showed the fracture line to be still present. The subsequent course of this swelling was the same as that of the other swellings: it disappeared in three weeks and has not recurred.

Discussion

A search of standard surgical textbooks and special textbooks on head injuries revealed no reference to this swelling in association with a fractured parietal bone. A search of the medical literature was equally without result. Several articles have been published by radiologists describing fractures of the skull in children. Ireland (1932) states that fracture of the parietal bone is the commonest fracture of the skull in children. He points out that the fracture line in the parietal bone often runs into the neighbouring bones (as in many of the present cases). He makes no reference to any associated swelling overlying the fracture. Pia (1953), who reviewed the literature on fractures of the skull in children and described a large number of personal cases, made no reference to the associated swelling in fractures of the parietal bone.

The nature and site of this swelling are of considerable interest. Because the swelling shows no overlying bruising and is not delimited by the suture lines of the skull, it is postulated that the swelling lies between the galea aponeurotica and the periosteum of the skull. Investigation of the nature of the fluid, however, is hindered by consideration for the patient. When experience has shown that the swelling is absorbed spontaneously, it is unjustifiable to subject a small child to elaborate investigations. In the baby girl, aged 15 months, whose swelling and radiograph are shown in figs. 1 and 2, the swelling was so large that aspiration was considered justified.

Fig. 1—Swelling over parietal bone in baby aged 15 months.

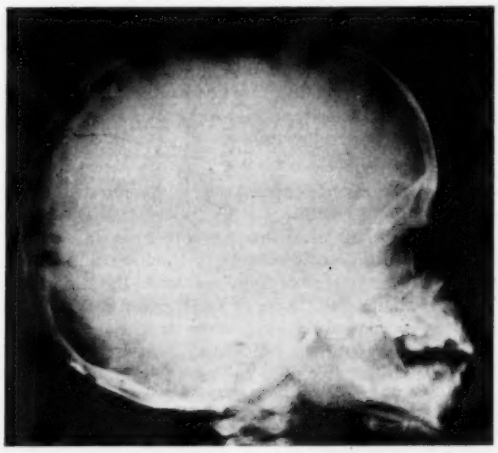

Fig. 2—Radiograph of same case as in fig. 1.

Aspiration through the shaved scalp produced 50 ml. of fluid which was heavily contaminated with blood and resembled that obtained by lumbar puncture after subarachnoid hæmorrhage. On standing the blood settled in the container, leaving a red-stained thin fluid above it, which was taken to be cerebrospinal fluid (C.S.F.) with some hæmolysis. The sugar content of this fluid was consistent with its being C.S.F.

Three days after aspiration a swelling had reappeared about half the original size but of exactly similar consistence. Re-aspiration was not considered justifiable. This new swelling was completely absorbed in two weeks.

It is postulated that with the fracture of the parietal bone there was a subjacent tear of the meninges. Leaking C.S.F. mixed with blood oozed through the fracture into the loose tissue spaces below the galea. In case 12, in which there was no fracture, fluid is assumed to have oozed between the suture lines. Lumbar puncture would probably yield bloodstained fluid and support this theory. It will be appreciated, however, that there was great reluctance to submit these children to such an unpleasant investigation, which was really only of academic interest.

It seems fairly clear that, in these cases, there is no danger of intracranial compression, and all these patients were treated as outpatients.

Summary

Twelve small children in whom a soft swelling developed over a parietal bone some days after an injury are reported. In eleven cases there was a subjacent fracture of the parietal bone, and the swelling was spontaneously absorbed within three weeks.

This type of swelling associated with fracture is apparently hitherto undescribed.

It is postulated that this swelling is due to a leak of C.S.F. and blood from a subjacent tear of the meninges, through the fracture line into the space below the galea aponeurotica.

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Preliminary Communication

THE MEMBRANE OXYGENATOR

SOME ASPECTS OF OXYGEN AND CARBON DIOXIDE TRANSPORT ACROSS POLYETHYLENE FILM *

CARDIAC surgery has entered a new phase in its development. Operations within the chambers of the heart are commonplace, and most are possible because machines take the place of cardiopulmonary function during such surgery. In the design of these machines the most vexed question remains the choice of method for gas exchange. There is a general leaning towards the principle of imitation of the normal pulmonary anatomy, where the blood is separated from the gas by a membrane. Pursuit of this ideal is exemplified by the continuing work of Clowes [1] and Kolff.[2]

During experiments with a design made by one of us (M. L. B.) of an oxygenator provided with a membrane certain factors have emerged which may alter the direction of emphasis in the search for the ideal membrane, and we have felt it of sufficient interest to report some of these initial experiments. They underline the importance of the character of such membranes in regard to the transport of carbon dioxide and indicate that this property may be of greater significance than has hitherto been realised.

METHOD

The membrane chosen for these studies was polyethylene $^{1}/_{1000}$ inch thick. It was supplied by the Visking Corporation, of Centerville, California. The mechanical description of the lung will be published elsewhere.

The design tested provided a surface area of 9·5 sq. m. for gas exchange and allowed a blood-flow of 3 litres a minute. Ancillary reservoirs, tubing, and a roller pump of DeBakey type, together with the oxygenator, contained 3 litres of blood and hence allowed a recirculation time of one minute for the blood contained.

* Aided in part by U.S. Public Health Service Grant no. H2192C2.

1. Clowes, G. H. A. *in* Extracorporeal Circulation (edited by J. Garrott Allen), p. 81. Springfield, Ill. and Oxford, 1958.
2. Kolff, W. J., Effler, D. B., Groves, L. K., Peereboom, G., Moraca, P. P. *Cleveland Clin. Quart.* 1956, **23**, 69.

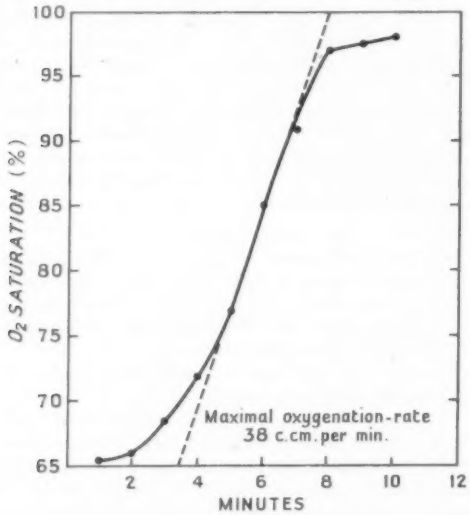

Fig. 1—Change in oxygen saturation of blood on admission of oxygen into membrane lung.

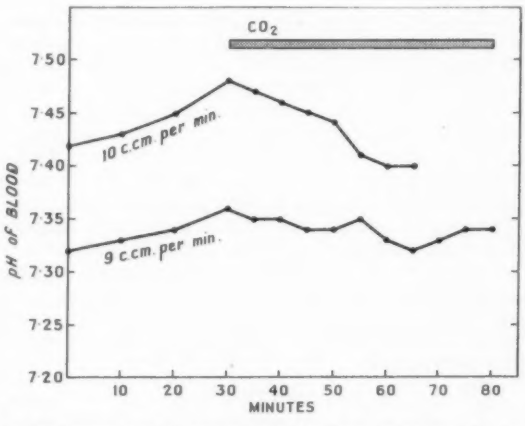

Fig. 2—Change in pH before and after carbon dioxide is added to blood at 9 c.cm. a minute and at 10 c.cm. a minute.

The flow of gas through the apparatus was more than 60 litres a minute to avoid stagnation. The respiring gas was recirculated through a carbon-dioxide absorber and through a gas heater, which could maintain a constant temperature after the apparatus had been preheated to the required degree.

For all the experiments beef blood was drawn from the slaughterhouse on the day of the study. It was introduced after the apparatus had been thoroughly rinsed with warm saline solution and after the gas spaces had been completely filled with nitrous oxide. This latter precaution allowed recirculation of blood within the apparatus without appreciable alteration in the oxygen saturation and thus ensured proper filling and mixing. After repeated measurements for oxygen content had established a steady state, the nitrous oxide was vented, and its place was taken by oxygen admitted at a rate of more than 30 litres a minute. Thereafter samples were withdrawn at one minute intervals until again a steady state was reached. The measurements of oxygen content were made by cuvette oximeter.†

During this period the blood pH was measured at five-minute intervals.‡ Such measurements were continued throughout the study.

After the rate of oxygen transport across the membrane had been determined, the ability to excrete carbon dioxide was estimated. This gas was added directly to the blood as it entered the oxygenator. Injections were made at a rate which was either at or in excess of the expected rate of excretion calculated from the permeability coefficient and the partial pressure of carbon dioxide.[3]

To eliminate inefficient absorption of carbon dioxide in the ventilating system a sample of the circulating gas was drawn continuously through a Liston-Becker CO_2 analyser,§ and at no time during the study was the presence of measurable amounts of carbon dioxide detected.

RESULTS

The results indicate that the average diffusion-rate of oxygen into the blood was 38 c.cm. a minute in the described circumstances (fig. 1).

Only an average of 9 c.cm. of carbon dioxide a minute could be added to the blood in these circumstances without causing a considerable change in the pH. An increase to 10 c.cm. a minute depressed the pH uniformly (fig. 2).

† Waters Conley Co., Rochester, Minnesota. Cuvette XC-50B no. 287.
‡ Cambridge Instrument Co., Ossining, New York. Model R.
§ Liston-Becker Plant, Beckman Instrument Co., Springdale, Connecticut.
3. Kammermeyer, K. *Industr. Engng Chem.* 1957, **49**, 1685.

In the absence of appreciable metabolism of the blood during the test it was inferred that the depression of the pH represented a failure of the membrane to excrete the added carbon dioxide at the rate of its addition.

DISCUSSION

Plastic membranes have clearly defined characteristics in respect to the passage of gases across them, and it has become established practice to use such membranes for the continuous separation of gaseous mixtures by fractional diffusion. Those in use in blood oxygenators at present are no exception to these laws.

The ratio of permeability values for oxygen and carbon dioxide when polyethylene is the membrane is

$$\frac{\text{Permeability coefficient of } CO_2}{\text{Permeability coefficient of } O_2} = 4$$

Hence four times as much carbon dioxide as oxygen may be expected to pass through a given membrane at the same partial pressure. To achieve worthwhile efficiency in present oxygenator designs it is usual to maintain an environment of 100% oxygen outside the membrane and thus a partial pressure of about 750 mm. Hg; but to maintain an acceptable blood pH the partial pressure of carbon dioxide in the blood cannot rise much above 50 mm. Hg. In fact, a partial pressure ratio of 15 to 1 could exist in favour of oxygen diffusion.

In these circumstances the relatively greater diffusion-rate (four times) of carbon dioxide is insufficient to counteract the partial pressure ratio; and therefore carbon dioxide can only be transported at about a quarter of the rate obtaining for oxygen. Similar characteristics must apply to all membranes whose function depends solely on gaseous diffusion; and, only if the permeability ratio for CO_2/O_2 were about 15, could a respiratory quotient of 1 be maintained in the presence of pure oxygen.

The results obtained in the present study (that 38 c.cm. of oxygen but only 9 c.cm. of carbon dioxide could be exchanged across the polyethylene membrane) support these theoretical considerations and closely parallel the expected values. We are thus forced to accept certain principles in the design of a membrane oxygenator. Where *gaseous diffusion is the only mechanism of gas exchange* the rate of diffusion of carbon dioxide is the "bottleneck" determining the area of membrane required. In the case of the polyethylene film studied this requirement necessitates a surface area four times as large as would be required for oxygenation with pure oxygen, which would involve the construction of an apparatus providing more than 250 sq. m. of surface area if adult man is to be adequately respired—for practical reasons an impossibility.

Fortunately, much more efficient alternatives to polyethylene exist, but it seems unlikely from the known characteristics of such membranes that they will allow of a carbon-dioxide/oxygen diffusion ratio greater than 5 to 1. This infers that, if oxygenation demands cannot adequately be met when room air is the respiring gas, some other type of membrane will have to be found.

Hitherto the search for effective membranes has been confined to those whose surface is "non-wetting". Such surfaces are inherently kind to blood and are desirable from this standpoint, but they do not allow use being made of an important physical property of carbon dioxide. This is its solubility in water: 25 times as great as that of oxygen. It is this property which is used in the animal lung, and it may reasonably be inferred that the principal mechanism of transfer of carbon dioxide across a water-absorbent membrane is its passage as dissolved carbon dioxide.

It may therefore be desirable to include the characteristics of "wetting" in the specifications of an ideal membrane. Perhaps it may even be advantageous to use two types of membrane in such an oxygenator to obtain the greatest efficiency for both oxygen and carbon-dioxide transport.

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Medical Societies

ASSOCIATION OF CLINICAL PATHOLOGISTS

THE Association's 60th general meeting was held at Trinity College, Dublin, on April 18 and 19. We publish below brief accounts of some of the papers presented at the meeting.

Myasthenia Gravis

Dr. A. L. WOOLF and his colleagues had reported [1] for the first time striking changes in the intramuscular nerve-endings in a case of myasthenia gravis; and similar changes had now been found in two out of a further three cases. The changes consisted of sprouting of the distal extremity of the subterminal nerve-fibres (which were sometimes irregularly swollen) and formation of multiple, bizarre, or unduly complex endplates. Cholinesterase preparations showed minute deposits of cholinesterase over a wide zone around the endplates, indicating that there were far more sprouts than were detectable with the light microscope alone. The changes resembled those seen in myositis, dystrophia myotonica, and thyrotoxic myopathy. These diseases had little in common as regards contractility of muscle but all showed evidence of endocrine imbalance. Dr. Woolf thought the changes in the nerve-endings were the result of muscle-fibre degeneration and lymphorrhages caused by this imbalance, which was also responsible for the disordered contractility.

Thyroid Gland after Treatment of Thyrotoxicosis

Dr. R. C. CURRAN, Dr. H. ECKERT, and Prof. G. M. WILSON reported that, by searching a hospital's pathological records over many years, 7 cases were found in which the portion of thyroid gland left after partial thyroidectomy was available for histological examination: the interval between the surgical operation and the necropsy or biopsy ranged from 1 to $14^1/_2$ years. For comparison, 13 glands treated by therapeutic doses of radioactive iodine had been obtained: these 13 patients died in hospital at intervals of a few days to $5^1/_2$ years after treatment. Full necropsies were performed. After partial thyroidectomy, the portion of gland left showed progressively decreasing cellular hyperplasia and increasing colloid storage. In the first weeks after treatment with ^{131}I, the irradiated glands showed disruption of follicles, necrosis and damage to epithelial cells, œdema and early fibrosis of the stroma, and widespread vascular lesions, including thrombosis. The more chronic effects of radiation treatment included stromal fibrosis and increasing numbers of altered epithelial cells, but more striking were the microfollicular structure and the comparative lack of colloid.

The two series of glands also seemed to differ metabolically, as judged by the results of giving a tracer dose of ^{131}I to patients rendered euthyroid by one or other method of treatment. In the post-thyroidectomy cases, the level of protein-bound radioiodine 48 hours after the test dose was almost invariably

1. Woolf, A. L., Bagnal, H. J., Bauwens, P., Bickerstaff, E. R. *J. Path. Bact.* 1956, **71**, 173.

normal—that is, less than 0·4%—which suggested a normal iodine pool in the thyroid gland. In contrast, in the irradiated series, the protein-bound radioiodine remained high on average, suggesting a reduced iodine pool in the thyroid gland, a result apparently in harmony with the histological finding of colloid lack.

Histology of Chronic Bronchitis

Dr. W. K. TAYLOR described the microscopical appearances of biopsy material taken from the carina in 54 cases of chronic bronchitis. All cases showed an increase of goblet cells up to 100% of the epithelial cells. Transitional-cell metaplasia was a very common finding (60%) and about 12% showed squamous metaplasia. Carcinoma-in-situ was seen in a few cases. In more than half the sections there was some degree of thickening of the basement membrane. In the lamina propria there was often some œdema and, occasionally, dilated lymphatics. Plasma cells were not infrequent but polymorphs were rare and no eosinophils were seen. Elastic fibres were reduced in number and often absent. Fibrosis was uncommon and when present it was fine and diffuse.

Bronchiolitis from Nitrous Fumes

Dr. A. J. N. WARRACK said that nitrous fumes were common in industry (dipping of metals, manufacture of toluene and cellulose, descaling and pickling of steel sheets after firing and rolling). Symptoms varied with concentration of the gas and duration of exposure: low concentrations merely provoked mild irritation of the eyes and upper respiratory tract; strong concentrations could cause severe pulmonary œdema. Sometimes, however, there was a latent interval of many hours or even days, and symptoms then took the form of dyspnœa, cyanosis, and paroxysmal cough. Secondary infection was a danger. A man carrying nitric acid in a rubber bucket noticed a leak and held the bucket over another of galvanised iron. He was enveloped in thick brown fumes for 30 seconds. He felt all right and finished his work. Seven days after exposure he sought medical attention, and he was admitted semicomatose and cyanosed to hospital two weeks after the original incident. He later died. Postmortem examination showed both bronchial trees filled with thick mucopus. The lungs were solid and section showed tiny yellow areas with the appearance of purulent bronchiolitis. Microscopical examination showed varying degrees of obliterative bronchiolitis from simple epithelial desquamation to complete bronchiolar destruction with surrounding alveolar organisation. There was presumably secondary infection of these areas, and it was thus important that antibiotic therapy should be given.

Phenol Reaction for Blood-sugar Estimation

Dr. T. M. HEALY, reporting on the use of this test for the past two years, said that simple sugars when treated with phenol and concentrated sulphuric acid gave an orange yellow colour, stable for some hours. The method gave accurate and consistent results. Compared with Folin and Wu's method the results were of comparable accuracy but the phenol method took a third of the time and needed less apparatus and cheaper reagents. There had been no accidents with the concentrated sulphuric acid. The method was suitable for routine use.

Megaloblastic Anæmia of Pregnancy and the Fuerperium

Dr. C. GILES and Dr. EILEEN M. SHUTTLEWORTH investigated pregnancy anæmia in 369 patients in Stoke-on-Trent during the twelve months ending Feb. 28, 1958. In 67 cases sternal puncture revealed a megaloblastic marrow. All patients responded to folic acid. Reticulocyte-counts varied from 8% to 33%, and the serum-iron fell after two or three days' treatment. 18 out of 53 cases tested had achlorhydria and the fæcal fat was raised in 7 out of 15 patients. No seasonal incidence was noted. The overall diet during pregnancy was poor in a much higher proportion of megaloblastic anæmias than with other types of anæmia: this was particularly evident in the case of meat.

Virology and the Clinical Bacteriologist

Dr. P. N. MEENAN said that tissue-culture methods of virus isolation had now become so widely used that new agents were constantly being recovered, many of them from apparently healthy people. The clinical bacteriologist had been slow to adopt the newer techniques, perhaps because of an exaggerated idea of their difficulties. Using these methods at least 50 viruses of man could be studied, and the value of a hospital laboratory would be enormously enhanced if it adopted such methods. The basic equipment was simple: a supply of suitable glassware and a deep-freeze cabinet (a secondhand ice-cream freezer) for the storage of specimens. High-speed centrifuges or even roller-drums were not at first essential. Tissue-culture media were now standardised and easy to prepare or obtain; simple antibiotic mixtures would eliminate bacterial or fungal contamination. For small laboratories the most suitable tissues were probably trypsinised human amnion or HeLa cells; in some laboratories uterus, minced and used as plasma-clot cultures, would be more convenient but was not as sensitive.

Precocious Puberty due to Chorionepithelioma of the Pineal

Dr. J. H. STEPHENS, Dr. D. F. CAPPELL, and Dr. J. L. EMERY reported two cases of pineal tumour associated with precocious development in boys.

(1) A precociously developed boy of 4 years was admitted with headache, vomiting, and a tumour of the pineal region. This was treated by X rays, and about 4 weeks later he died suddenly of intraventricular hæmorrhage. At necropsy the cerebral tumour was wholly necrotic but the lungs contained multiple hæmorrhagic nodules with the structure of chorionepithelioma, from which it was inferred that the pineal growth was of this nature.

(2) A boy of 10 had signs of somatic and sexual precocity and mild polyuria. About 9 months later nervous symptoms developed, with diplopia, mild fits, athetoid movements, and drowsiness. Examination revealed a pineal tumour with hydrocephalus for which a short-circuit operation was performed. Death followed suddenly from intraventricular hæmorrhage, and necropsy revealed a large hæmorrhagic growth replacing the pineal and invading the adjacent brain substance. There were no secondary growths.

Despite the known activity of such growths in secreting chorionic gonadotrophin, the development of somatic and sexual precocity was not likely to be attributable to these effects, but it was thought to be similar to that responsible for precocity in other pineal growths—e.g., teratomata, and in certain lesions, both tumours and inflammatory or destructive, in the posterior part of the hypothalamus—by the interruption of the inhibitory nervous pathways which control the release of hormones from the anterior pituitary.

Prophylaxis of Pulmonary Embolism

Dr. N. M. GIBBS had investigated the relationship between venous thrombosis of the lower limbs and bed rest. Thrombosis began in two separate and clearly defined sites—namely, the leg and the thigh—where venous stasis was particularly likely. A simple apparatus had been designed which afforded complete control of exercise of leg and thigh muscles in patients confined to bed. The "soleus ergometer" consisted of a pivoted platform attached to a spring of variable tension. The platform was depressed by plantar flexion of the feet and each full movement of the platform was recorded on a meter. The apparatus was mounted on an adjustable carriage clamped to the foot of the bed. The spring tension and position of the apparatus may be adjusted with regard to height, age, and strength of the patient. An average of 30 recorded acts of plantar flexion per hour during the waking hours was thought to be adequate in preventing thrombosis.

Cytological Observations on Carcinoma

In their study of invasion of tissues by carcinomas, Dr. R. A. Q. O'MEARA and Mr. R. D. JACKSON had applied standard cytological methods to fresh biopsy material. Staining of the Golgi apparatus had shown different results in humans from those obtained by Ludford[1] in animals. In

1. Ludford, R. J. *Quart. J. micr. Sci.* 1924, **69**, 27.

squamous-cell carcinomas it was found that the arrangement of the Golgi apparatus in the normal epidermis corresponded to that found in carcinoma invading the tissues, in so far as the basal cells of the epidermis corresponded to the peripheral cells of invading carcinoma, and the mature cells of the epidermis undergoing keratinisation corresponded to those of the central parts of the carcinoma. Thus, in squamous carcinoma, the tumour was maturing by mitosis and keratinisation towards the centre of the growth, while the peripheral cells of the carcinoma were growing outwards into the tissues in the opposite direction. It was found that the peripheral cells, when stained to show mitochondria, appeared to be forming fibrils, which were deposited on the outlying invading cells. Sometimes the invading cells were overwhelmed by the deposit and they were then removed by phagocytes; for the most part they thrived and grew outwards into the deposit. The fibrils could be found in advance of the main body of the tumour, forming a coagulum in the tissue spaces, thus interfering with the nutrition of the cells of the part and providing the carcinoma cells with an advantage.

HEBERDEN SOCIETY AND DUTCH SOCIETY OF RHEUMATOLOGISTS

THE Heberden round and a joint meeting of the Heberden Society and the Dutch Society of Rheumatologists were held at Leiden on April 25 and 26.

Rheumatoid Arthritis and Pericarditis

Prof. J. GOSLINGS gave the annual Heberden round at the University Hospital. He described 13 cases of pericarditis and rheumatoid arthritis, 3 of which had come to necropsy. Most of the patients had severe active rheumatoid arthritis, and some had other visceral involvement. Several had the lupus-erythematosus (L.E.) cell phenomenon. In 4 patients pericarditis had been recognised where the duration of rheumatoid disease had been less than eighteen months. The clinical recognition of pericarditis might be difficult; physical signs might be transient and the electrocardiogram negative in cases showing pericarditis at necropsy. Professor Goslings thought that this difficulty might explain some of the differences in the reported prevalence of pericarditis between patients and necropsy series.

Incidence of Fractures

Dr. S. A. DEN OUDSTEN and Dr. B. SPEYER (Rotterdam) had compared the frequency of spontaneous fractures of long bones and crush fractures of the spine in a group of adult patients with severe rheumatoid arthritis, with that in a control group of comparable non-rheumatoid invalids. In both groups the age of the patient and the degree of immobilisation contributed significantly to the development of both types of fracture, but no significant difference could be found between the rheumatoid group and the controls. Cortisone in the usual therapeutic doses did not seem to increase the incidence of fractures.

Latex Fixation Test

Dr. H. A. VALKENBURG and Dr. C. A. DE MOS (Leiden) had used the 'Latex' fixation test of Singer and Plotz for the diagnosis of rheumatoid arthritis, with certain slight modifications including the use of a glycine buffer (pH 8·2) instead of a borate buffer, and a longer time between preparation and reading of the test. A titre of 1:20 was taken as positive, and the test showed good reproducibility. Serum samples from 1023 patients and controls were tested. Of those with definite rheumatoid arthritis, 86% showed positive reactions; 83% of non-rheumatoid patients and 92% of the normal subjects gave negative reactions. When the results were analysed in terms of strong reactions only, the proportion of non-rheumatoid positive reactions was reduced to 3·6%.

L.E. Cells

Dr. W. HIJMANS and Dr. H. R. E. SCHUIT (Leiden) discussed the L.E.-cell phenomenon. In 2000 patients with various diseases they had discovered 200 positive cases, but only 1 of these positive cases could not be classified as belonging to the group of so-called collagen diseases. The hypothesis (as yet unproved) that the L.E. cell was the result of an immunological mechanism had received strong support from many workers. It seemed that nuclear protein, or a part thereof, but not desoxyribonucleic acid, could be regarded as antigen, and the L.E.-cell factor (a component of L.E. globulin) as autoantibody. They had shown that the L.E.-cell factor could react with the nuclei of calf thymocytes and of hen red blood-cells. Even if phagocytosis were prevented, the typical "inclusion" bodies could be formed, though of course they were then free and unincluded, and therefore phagocytosis itself was not an essential part of the reaction. They had shown that leucocytes would engulf nucleoprotein itself in the presence of L.E. factor.

Leukæmia

Dr. E. KRUYFF (Wassenaar) reported that of 1996 Dutch patients with ankylosing spondylitis treated with radiotherapy, in whom a follow-up rate of over 90% had been achieved, there had been 256 deaths, 25 of which were due to leukæmia or aplastic anæmia—thus confirming the increased incidence of leukæmia after radiotherapy, to which Van Swaay had called attention in 1950. Several instances of leukæmia in patients treated with deep X-rays for conditions other than ankylosing spondylitis had been reported. The incidence of leukæmia was steadily rising in the Dutch population as a whole.

Aspirin and Occult Blood

Dr. L. TH. F. L. STUBBE (Leiden) had found occult blood, judged by a positive benzidine reaction, in the stools of about 70% of 180 persons (140 patients, 40 normal controls), to whom aspirin had been administered in tablet or powder form. The phenomenon was reproducible in patients who showed it, and the alternation of aspirin with sodium salicylate was followed by the appearance and disappearance of the occult blood from the stools. The amount of aspirin taken had little influence on the appearance of occult blood. From the strength of the reaction, and from spectrophotometric determinations, it was shown that the positive benzidine reaction was indeed due to blood, and that up to 4 ml. a day might be lost in this way. This figure exceeded the normal blood-loss of menstruating women, and might be significant in the production of anæmia in rheumatoid arthritis.

Reviews of Books

Applied Physiology of the Eye

The late H. WILLOUGHBY LYLE, M.D., F.R.C.S.; assisted by T. KEITH LYLE, C.B.E., M.D., M.R.C.P., F.R.C.S. London: Baillière, Tindall, & Cox. 1958. Pp. 342. 45*s*.

THE physiology of vision is a subject seldom adequately presented to the undergraduate student, for it includes not only the whole of the processes involved in the formation of retinal images and their appreciation in the visual cortex but also those mechanisms concerned with the maintenance of the ocular circulation, metabolism, and pressure, and the neuromuscular apparatus of ocular movement. This is one of the reasons why the average medical graduate finds difficulty in interpreting signs and symptoms of ocular disorder, and it accounts too for the relative seclusion of ophthalmology as a purely postgraduate specialty. A textbook of applied physiology of the eye could do much to remedy this defect, and in the 22 chapters of this volume there is much that will enable the student and the aspirant to higher qualifications to interpret physiologically some of the visual disorders he sees.

Anatomy must have a prominent place in the discussion of nervous mechanisms, and the fact that this part of the subject is treated descriptively rather than diagrammatically is responsible for its occupying the major part of the text in the chapters dealing with the ocular tissues and the cerebral structures associated with visual processes. The parallel physiological explanation is lucid, and it is supplemented by reference to

pathological conditions which provide a useful clinical background to the main description. The selection of these pathological examples is perhaps in keeping with the eclectic character of the work as a whole, but it does not always contribute to the clinical perspective which the authors evidently seek. The emphasis laid on encephalitis lethargica and the omission of tabes dorsalis as a cause of ptosis may be cited as a minor example of this, and the inclusion of episcleritis as the sole example of ocular collagen disease is another.

The chapters dealing with cerebellar coordination, the thalamus and hypothalamus, and the VIIIth-nerve mechanisms form stimulating additions to the more purely ophthalmological parts of the text, but it is disappointing that so little space could be devoted to the visual tracts and the fields of vision. The omission of any reference to the optical mechanisms of retinal image formation will also be missed by the ophthalmologist in training. The short sections on ophthalmological eponyms and the Greek derivation of certain ophthalmological terms, however, form a welcome addition to the bibliography at the end of the book.

The Handicapped and Their Rehabilitation

Editor: HARRY A. PATTISON, M.D., F.A.C.P., director of the Potts Memorial Institute, Hudson, N.Y. Springfield, Ill. Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957. Pp. 944. 112*s.* 6*d.*

THE rapidity of a patient's return to full activity after an illness once depended on the efforts of only two people—the patient himself and his doctor. They will always be the two prime movers in reablement, but this new symposium from America draws attention to the number of allies whose assistance they may now profitably invoke. Forty-four writers have contributed, nineteen of them medically qualified: the others include physiotherapists, industrial psychologists, social workers, trade-union officials, a chaplain, and even a musician. The editor suggests that the help of any or all of these ancillaries may be required to restore a patient to the complexities of modern life.

Ten chapters relate to the treatment of particular illnesses (diabetes, tuberculosis, and cardiac diseases, for example); but most of them describe generally applicable rehabilitation methods, including some, such as music therapy and bibliotherapy, which have seldom been accorded separate consideration in this country. A comparatively small part of the book is concerned with legislation and administrative details peculiar to the United States.

Even allowing for the range of topics it describes, the book gives the impression that each chapter is addressed to a different audience. Sometimes (as in the section listing technical faults in cleft-lip repair operations) that audience seems very specialised. But many sections, such as an admirable one dealing with epilepsy, are of wide interest. Though it does not deal with practical details, or the reablement of individual patients, the book discusses some problems, such as those posed by colostomy and by facial deformity, not mentioned elsewhere ; and these sections will help many physicians and surgeons. Moreover, in its entirety, the volume will help all those responsible for that coordination of the activities of many specialists which effective rehabilitation requires.

The Mammalian Cerebral Cortex

B. DELISLE BURNS, M.R.C.S., assistant professor of physiology, McGill University, Montreal. London: Edward Arnold. 1958. Pp. 103. 21*s.*

THIS monograph, which is the fifth in the present series sponsored by the Physiological Society, discusses only a few selected aspects of its title. Those who know Dr. Burns' work on the isolated cerebral cortex will not be surprised that this provides a central theme for the book. " Isolated cortex " in this context refers to a slab of tissue from the surface of a cat's cerebrum which retains its pial blood-supply but has had all its neuronal connections severed. The electrical properties of such preparations are described, and this provides a background for discussion of possible neurophysiological mechanisms which may be involved in activities like remembering and learning and in the interaction of different cortical areas. The question whether or not spontaneous activity (here defined as the capability to discharge at moments not dictated by the precise times of arrival of energy from outside) is a characteristic of cerebral neurones is considered at some length without, however, any conclusion other than that the answer is not of immediate importance.

Much of the ground usually covered in textbook accounts of the physiology of the cerebral cortex is omitted, but Dr. Burns has succeeded well in his declared intention of writing for those " who do not operate oscilloscopes " about particular aspects of neurophysiology which intrigue him. Readers whose curiosity is aroused by these topics will find plenty to hold their interest in this clearly written and adequately illustrated book.

Polymyositis

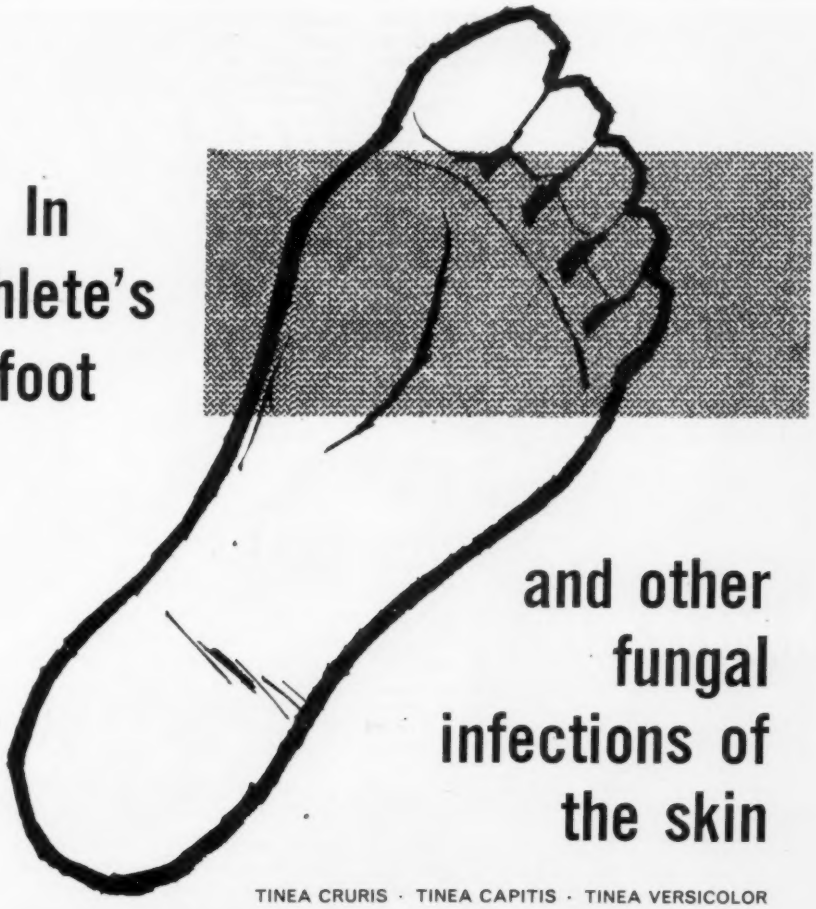
JOHN N. WALTON, M.D., M.R.C.P., first assistant in neurology, King's College, University of Durham; RAYMOND D. ADAMS, M.D., Bullard professor of neuropathology, University of Harvard. Edinburgh and London: E. & S. Livingstone. 1958. Pp. 270. 32*s.* 6*d.*

THE authors review the group of disorders which includes dermatomyositis, scleroderma, generalised myositis fibrosa, relapsing myositis, and calcinosis universalis, and add 40 new cases of polymyositis of which 25 were seen by one or both authors. They describe the clinical picture and differential diagnosis, paying particular attention to the points of distinction from muscular dystrophy, notably the presence of weakness of the neck muscles and sometimes of swallowing in polymyositis. Skin lesions may be a valuable aid to diagnosis, but they are by no means necessary to the diagnosis. The differential diagnosis is of importance because patients with polymyositis may benefit from corticoids. The book is full of valuable references to the literature, but so much detail is given that it is not an easy book to read, and the salient features may be lost in detail.

Frazer's Anatomy of the Human Skeleton (5th ed. London: J. & A. Churchill. 1958. Pp. 247. 50*s.*).—Dr. A. S. Breathnach's revision of Prof. J. E. Frazer's classic will appeal to anatomists, and to surgeons training for the primary fellowship. It is 18 years since the last edition, and much recent work on the development and growth of bone has been included. Dr. Breathnach has, however, wisely maintained the original qualities of the book, which still offers the best text in descriptive osteology. Frazer's illustrations remain largely untouched. Though not attractive in style, they are so clear and accurate in relating soft parts to bones that it would not be easy to improve them. A few new drawings and, for the first time, radiographs have been added. There has been some rewriting, and this has improved the text; we hope that it will be extended in later editions. A wider bibliography would have made the volume more valuable to professional anatomists. Like many texts of descriptive anatomy, it is parsimonious in functional interpretation of structure, and an addition of a few pages would invigorate and illuminate. Old favourites like the arches of the foot are mentioned, but ribs are still chiefly a protection to viscera; we tour the orbit and leave it with no views on its functional appropriateness; the femur is long, but we are not told why. If anatomists do not give some time to the significance of gross anatomy, who will?

The Door of Serenity (London: Faber & Faber. 1958. Pp. 119. 21*s.*).—This book by Dr. Ainslie Meares describes and illustrates by a series of 24 coloured plates the stages of a lengthy and eventually satisfactory psychotherapy of a young schizophrenic girl. Jennifer, as she is called, was 19 when first seen by Dr. Meares, and the usual types of treatment proved unsuccessful. She then began to bring him paintings, and over the next few years produced over 200 of these, from which he was gradually able to learn and interpret to her the root causes of her illness. The book is not a complete or detailed case-history, but an outline of an interesting voyage of discovery undertaken by patient and therapist together.

In athlete's foot



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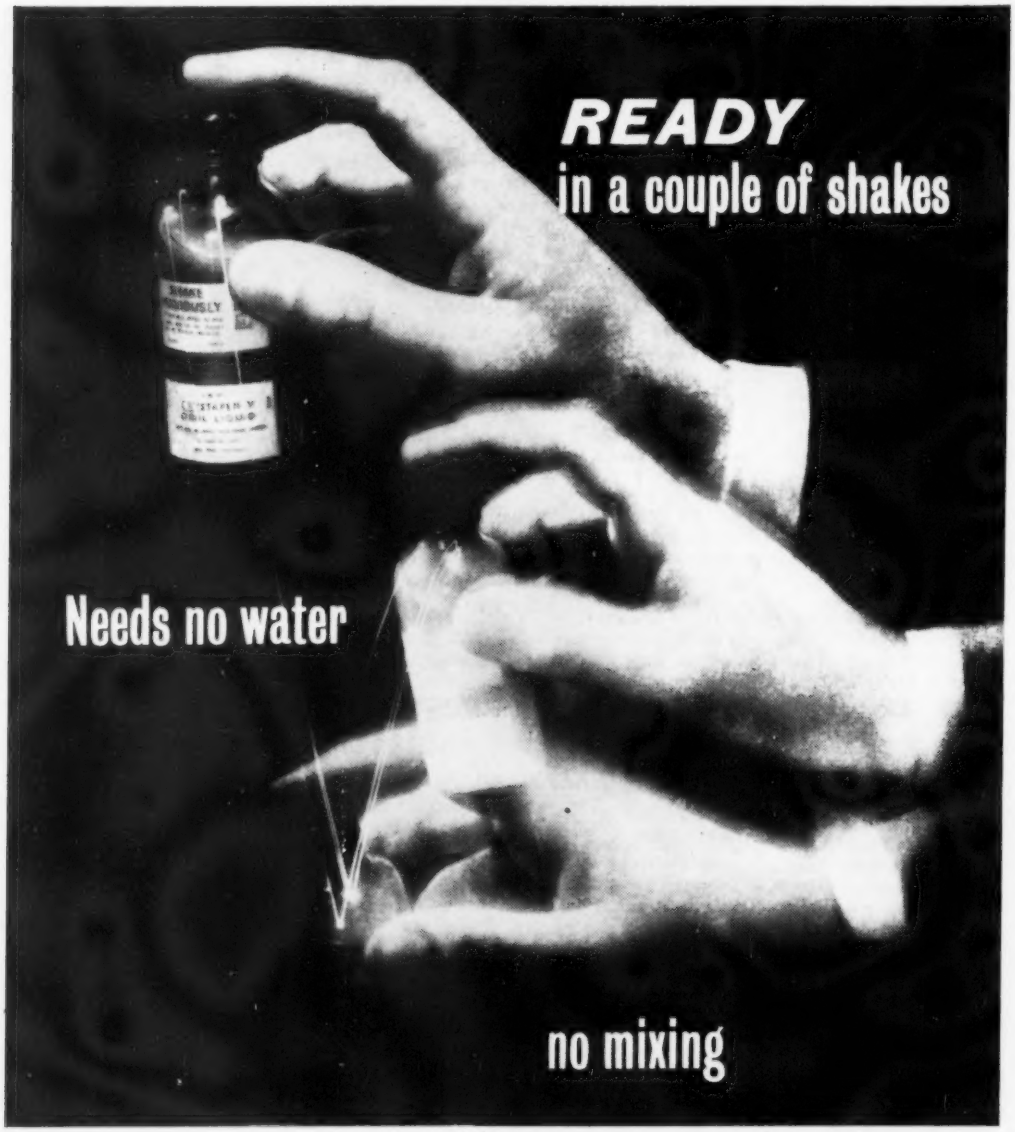

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THE LANCET
LONDON 17 MAY 1958

American Reactions to the Staphylococcus

LIKE ourselves our American colleagues are worried by the high incidence of staphylococcal sepsis.[1] They note that reports of the same problem come from what they describe (apparently without intended irony) as "all medically advanced parts of the world". With characteristic energy and thoroughness, the American Medical Association, supported by sixteen other influential agencies, convened a conference of experts to discuss all aspects of the problem at Cleveland on Nov. 14, 1957. The essentials of the conference have now been published.[1 2] The experts remarked on the widespread dissemination throughout the hospitals of the United States and Canada of highly virulent, readily communicable, antibiotic-resistant strains of *Staphylococcus aureus* with a tendency to produce nasal carriers, skin lesions, wound sepsis, soft-tissue infections, and pneumonia. Neonatal infections and breast abscesses among nursing mothers were especially noted as troublesome to the sufferers and likely sources of spread of dangerous staphylococci to the general population. The conference thought that the situation arose from a tendency to relax the rigorous aseptic precautions which should be observed in hospitals and to rely instead on prophylactic administration of antibiotics. Vigorous investigation followed by rigorous measures often controlled infection in particular hospitals for the time being. Nevertheless, the conference considered that the troublesome hospital staphylococci had a special propensity for becoming resistant to a wide range of antibacterial agents, including leucocytes. It was on no less certain ground in proclaiming that we lack basic information about the ecology, pathogenesis, immune relationships, and variability of staphylococci —our knowledge of these matters being much poorer for staphylococci than for streptococci, pneumococci, and other pyogenic microorganisms. The conference recommended encouragement and money for research into these matters, and it suggested that every hospital should charge a responsible officer or committee with the investigation, control, and prevention of infections within the hospital. The whole community was advised to tackle the problem of spread of staphylococcal infection beyond hospitals through medical societies, local health departments, and inter-hospital committees on infections.

Of the need for some such actions there can be little doubt. How many hospitals in our own country are confident about the efficacy and safety of their sterilising and laundry procedures? How many provide clean air, or even abstain from doing operations and wound dressings in air that is richly charged with pyogenic bacteria? How many hospitals have effective procedures for checking whether members of staff with septic lesions on their persons are going about their duties and operating on, or otherwise attending to, patients whose tissues may have a lowered capacity to resist infection? In how many hospitals are junior medical staff or even nursing staff left to prescribe whatever antibiotics they happen to think might be useful? To what extent are antibiotics needlessly used as prophylactics in circumstances where the probability of sepsis is less than the risk of poisoning or sensitising the patient or producing another focus of antibiotic-resistant microorganisms? In practice, we regularly transgress in all these aspects of hospital routine. Defective sterilisers blow steam around without certainly producing sterile dressings. Laundries contaminate articles that were formerly free of pathogens. Hospital air is sucked from anywhere to anywhere else—even through the sterilised dressings inside sterilisers. Ward maids with pan and brush sweep rooms in which mothers put their infants to the breast. Nurses make beds immediately before or even during dressing rounds. Fluffy woollen blankets provide warmth scarcely needed in centrally heated hospitals; they cannot be sterilised or even very often washed without ruining them, and they fill the air with bacteria-laden dust. Nurses with boils on their noses remain on duty because they do not know the menace that they carry to their patients. Chiefs with an optimistic assurance that they have no trouble—whoever else may have it—leave instructions with sister to "give an antibiotic if it is needed". In the midst of all this, the bacteriologist may lecture, the superintendent may feel vaguely worried, the matron may consider that polishing is not enough; but—in the absence of flagrant disaster—nobody has power to act. Nobody, in all probability, even knows or can ascertain the exact rate of cross-infection in his own hospital. Probably things are at their worst in big hospitals with many separate units under distinguished chiefs. Disagreeable facts are not always revealed to the chief; to his eye all appears to go well. Terrible things, it is rumoured, happen downstairs and up above—but not here. And so the menace continues.

In considering which of the American proposals are applicable to our own situation, we hesitate to urge more sittings of committees or more committees. Many hospitals now have cross-infection committees. There should be one in every hospital, for its educative value may be considerable. But probably the general establishment of the post of hospital infection officer will have to be considered. Such a person should be senior in years and of consultant status. All infections, however trivial, should be reported to him, and he should see that they are properly investigated and the results recorded. He should be encouraged to go everywhere and probe everything that strikes his mind as possibly in need of investigation. He should systematically make the results of his work known to people concerned and to the medical and nursing staff as a whole. He should keep the administration in mind of its duty to provide a clean and wholesome hospital. Education and propaganda may accomplish some

1. Conference on Staphylococcic Infections. *J. Amer. med. Ass.* 1958, **166**, 1177 1203; see also leading article, *ibid.* p. 1205.
2. Ravenholt, R. T. *Amer. J. publ. Hlth*, 1958, **48**, 277.

useful results, but they are not sure enough. When it is important to ensure results responsibility must often rest with a single person. That is why we now advocate the appointment as hospital infection officers of men of the highest professional and personal qualities. This action has long been advocated by COLEBROOK,[3] and we believe that it is now required in order to control the increasing scandal of hospital cross-infections —a scandal which we seem unable to prevent by the gentle processes of self-education and self-discipline.

Extracorporeal Circulation

". . . THE real key to further advance in the surgical treatment of established cardiac defects will only be provided by . . . some simple and efficient method of maintaining the cerebral circulation while the heart is temporarily out of commission. Naturally there are many other problems of a more local nature for solution . . . but, so long as the surgeon is faced with the certainty of irreparable cerebral damage if he interrupts the circulation for any appreciable period, he has little incentive to devise operative procedures which can never be carried out."

THE late LAWRENCE O'SHAUGHNESSY wrote these words in 1939,[4] and they were repeated by Dr. JAMES WATT, director of the National Heart Institute of the U.S. Public Health Service, in his opening address to the Conference on Extracorporeal Circulation in Chicago in September, 1957. O'SHAUGHNESSY recognised the ultimate need for extracorporeal circulation at a time when even closed operations on the heart were little more than a theoretical possibility. He described some of his early experiments in animals with a perfusion apparatus, and clearly appreciated the essential part that was to be played by animal experiment.

Following the work of a few pioneers in this country, in Sweden, and in the United States, the possibilities implicit in the successful application to man of the methods of extracorporeal circulation have been widely realised, and in the past three years a tremendous surge of enthusiasm has resulted in the cure of many patients. During this period of development a vast quantity of experimental data—animal, biochemical, technological, and clinical—has accumulated and rival schools of technique were beginning to emerge. In March, 1957, the surgical study section of the National Institutes of Health of the United States Public Health Service were asked by the National Advisory Heart Council to organise a conference on a world-wide scale to bring together workers in this field. The conference, held in Chicago in September, was most successful, and a full report of its proceedings has just been published in this country.[5]

Among all the scientific data may be found clinical results of great excellence: J. W. KIRKLIN, for example, reports from a total of 245 cases no deaths due to perfusion in the last 39 patients and DEWALL from a slightly greater number of cases only 1 death from any cause in the last 40 patients, most of whom can be considered cured. Such good results from these experienced workers were not obtained early in their series. KIRKLIN reports 6 deaths in the first 10 patients and a further 6 deaths in the succeeding 27. While some of these early deaths could now be avoided even by the inexperienced, because the causes are becoming clear, it seems inevitable that such a complex procedure will continue to carry a high initial mortality. Proper selection of cases will undoubtedly help to improve results; the selection of early cases is a grave responsibility for physician and surgeon alike.

The general methods of perfusion and surgical technique are now established; and both apparatus and operative procedures are being constantly improved. The goal of a really satisfactory oxygenator using diffusion of respiratory gases through a membrane is still distant; but it may have been brought a stage nearer by the report from Dr. MELROSE and his colleagues on p. 1050. The difficulties are partly mechanical (namely, in providing a surface area of membrane comparable to that in the human lung) and partly physiological (namely, in securing a material for the membrane which is innocuous to blood, is readily sterilised, and has the necessary diffusion characteristics for respiratory exchange).

It is becoming increasingly apparent that progress in this field is expensive. The National Advisory Heart Council in the United States has approved grants of over $700,000 for future use in research on extracorporeal circulation; and this is over and above money derived from the universities and private benefaction. In this country funds for research have been derived principally from the universities and from the Nuffield Foundation; but, with the reliability of oxygenators established, the main charge should fall henceforth on the National Health Service. The need now is for a few teams, well supported technically, working constantly together clinically and in the laboratory.

Modified A.I.D.

THERE has lately been heightened interest in the legal and moral issues raised by artificial insemination with donor's semen (A.I.D.) for solving the problem of the childless couple where male infertility is the cause. Clearly A.I.D. is open to weighty objections, and any alternative method deserves careful consideration. At the Hadassah University Hospital in Jerusalem Dr. S. ROZIN has been testing a modified technique of artificial insemination.[6] ROZIN obtained semen samples from infertile husbands and separated the spermatozoa from the plasma. The spermatozoa were then suspended in plasma obtained similarly from a normal donor's semen. Five women of childless marriages were inseminated with their husband's spermatozoa suspended in this way and two of them became pregnant. Firm conclusions obviously cannot be based on such limited figures, but ROZIN's idea merits some discussion.

Successes with this method would be open to at least two explanations—namely, that donor spermatozoa

3. Colebrook, L. *Lancet*, 1955, ii, 885.
4. *ibid.* 1939, ii, 969.
5. Extracorporeal Circulation (edited by J. GARROTT ALLEN). Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1958. Pp. 518. 57*s.* 6*d.*
6. See *N.Y. Times*, April 14, 1958.

were accidentally included in the material used for insemination, or that abnormality of the plasma of the infertile semen impaired the normal function of the spermatozoa. Complete removal of spermatozoa from semen by centrifugation is remarkably difficult. Centrifugation sufficient to produce a dense pellet of spermatozoa and other particulate bodies at the bottom of the tube may still leave actively motile spermatozoa suspended freely in the supernatant plasma. The presence of these cells may go unsuspected, for the dilution of the spermatozoa is so extreme that their detection under the microscope requires patient examination. It is reasonable to suppose that the spermatozoa that remain suspended in the plasma are there chiefly because they were among the most actively motile cells in the sample population. Centrifugation may therefore have selected the most vigorous and presumably potentially the most fertile spermatozoa of the donor's semen, and their presence would constitute a very special hazard if the plasma were employed by ROZIN's method. Abnormality of the plasma of infertile semen might manifest itself as a deficiency of some normal component; but it is most unlikely that lack of a normal constituent per se could underlie failure of spermatozoa to initiate conception, for pregnancy can be obtained by inseminating spermatozoa recovered from the epididymis and suspended in physiological-saline solution.[7] On the other hand, deleterious effects on spermatozoa may conceivably result from gross imbalance of plasma composition, from a normal plasma constituent in abnormally high concentration, or from a foreign toxic substance in the semen. These possibilities are largely hypothetical, and much work is still needed to establish their occurrence and practical significance.

Many observations have been made on conditions affecting spermatozoa in vitro[8]; and it is known that they are, on the whole, more resistant than most body cells to changes in physical and chemical environment. Motility is, of course, abolished if conditions depart sufficiently from normal; and it is reduced by metabolic enzyme inhibitors. Usually spermatozoa recover their motility if removed from the medium containing the inhibitor before too long a time has passed and are placed in a medium lacking inhibitory effect. Recovery occurs perfectly well in artificial media, and therefore does not depend on the presence of any constituent of the male accessory secretions. Broadly speaking, fertility is correlated with motility.[9,10] Generally, fertility is lost before motility, and PARKES[11] and PARKES et al.[12] have shown loss in this order to be especially constant following the use of certain enzyme inhibitors, which remove fertility without greatly affecting motility. WERTHESSEN et al.,[13] in a study of seminal properties and fertility in stud stallions, exchanged the spermatozoa and the seminal plasma of several animals and noted that the plasma of different animals differed in its capacity to maintain spermatozoon motility. Maintenance of motility was inversely correlated with the concentration in the plasma of non-protein sulphydryl compounds, which evidently exerted a deleterious influence on the spermatozoa. Further investigations showed that fertility also was inversely associated with the concentration of these compounds. Finally, the investigations were extended to man, and here again the concentration of non-protein sulphydryl compounds, though much lower than in stallion semen, was inversely correlated with motility maintenance. WERTHESSEN et al. infer, therefore, that in man, too, the sulphydryl concentration may be inversely related to fertility.

Thus in the human male infertility may sometimes be due primarily to abnormality of the seminal plasma, and this abnormality may possibly take the form of unusually high levels of non-protein sulphydryl compounds. If this were proved to be so, remedial measures would involve removal of the spermatozoa from their native plasma. Insemination would require resuspension of the spermatozoa in another medium, but this need not necessarily be seminal plasma unless the damage suffered by the spermatozoa could be repaired only by a specific factor in normal semen. Meanwhile much further research is clearly needed.

7. Hanley, H. G. *Stud. Fertility*, 1956, **8**, 20.
8. Mann, T. The Biochemistry of Semen. London, 1954.
9. Bishop, M. W. H., Campbell, R. C., Hancock, J. L., Walton, A. *J. agric. Sci.* 1954, **44**, 227.
10. Bishop, M. W. H. *Stud. Fertility*, 1955, **7**, 48.
11. Parkes, A. S. *Lancet*, 1953 ii 1285.
12. Parkes, A. S., Rogers, H. J., Spensley, P. C. *Stud. Fertility*, 1954, **6**, 65.
13. Werthessen, N. T., Marden, W., Haag, F., Goldzieher, J. W. *ibid.* 1956, **8**, 42.

Annotations

A NEW AUSTRALIAN MEDICAL SCHOOL

IT is exciting to contemplate the long-overdue rebuilding of some of the medical schools in this country—for example, at Liverpool, as we report on p. 1066. But how much more exciting to welcome a completely new school! Men and women of Western Australia wishing to study medicine have had to leave their home State, usually for Adelaide, for the preclinical and clinical years, and in 1955 the Government decided to establish a medical school at Perth—provided that the university could show that public opinion was in favour by the stringent test of raising £400,000 by appeal (the population of the State is less than 700,000). The result of the appeal was unequivocal, for more than £500,000 was subscribed, and plans for a new school were begun; and on April 10 Sir Charles Gairdner, the Governor, formally opened it.

The faculty of medicine is the ninth in the university. Teaching began with the academic year in 1957, when a first-year class of 85 students was enrolled, and 16 Western Australian students who had been studying at Adelaide began their sixth-year work at Perth. The departments of anatomy, physiology, and biochemistry began teaching in March.

The school buildings are not yet complete; but more interesting than the prospects of new buildings are the prospects for teaching and research. In designing its teaching programme the new school is doubly free, for not only has it no traditional curriculum but also it begins work at a time when the General Medical Council has relaxed its detailed control and permits experiments. Until 1957 the Council had been precise and detailed, and while its influence had certainly maintained an adequate standard of education in English and Australian

medical schools, it had tended to stifle individual enterprise in the framing of new forms of teaching or new approaches to the medical curriculum." Today the staff have an opportunity for boldness. For research there is ample money available, since, besides several bequests made in the years before the appeal and a gift to establish a research foundation (primarily for investigation of cardiovascular disease), £250,000 of the appeal moneys has been set aside for research and special projects, and the balance, beyond the sum needed to establish the school, has been used to form a permanent endowment fund. We send our greetings and good wishes to all concerned in the new school.

HYPERTENSION DUE TO RENAL-ARTERY STENOSIS

ANY lesion which significantly narrows a renal artery may induce hypertension. This type of hypertension is important particularly because it may be relieved by restoring an unobstructed blood-flow to the kidney, or by nephrectomy if the disease is unilateral.[1] It has long been recognised that such conditions as unilateral atrophic pyelonephritis may be associated with reversible hypertension; but that stenosis of the main renal artery can cause increase of blood-pressure has become apparent only in the past few years. A renal humoral mechanism, similar to that demonstrated by Scott and Bahnson,[2] in thoracic coarctation of the aorta, is thought to be responsible. Hypertension due to unilateral renal arterial stenosis differs, however, from that due to coarctation in that the contralateral kidney is exposed to the full effects of the disease.

Although few instances of hypertension associated with renal-artery stenosis have been reported, a surprising variety of lesions has been noted: in young people congenital stenosis and other anomalies of the renal-artery, aneurysm of the renal artery, and coarctation of the abdominal aorta; in older patients atherosclerosis, trauma, compression, thrombo-angiitis, and embolism of the renal artery.

The symptoms and signs of this type of hypertension are unfortunately no different from those of other types: the diastolic level is high and stable, and signs and symptoms progress rapidly. Diagnosis is therefore not easy and depends essentially on arteriography. It would obviously be unwise and unnecessary to subject every hypertensive patient to renal arteriography, and much judgment is needed to select patients for this elaborate investigation. DeCamp and Birchall [3] advise arteriography in all patients whose hypertension develops (in the absence of primary renal disease) before the age of 25, and in all in whom persistent severe diastolic hypertension comes on after the age of 50—similar recommendations to those of Poutasse and Dustan.[4] In the intervening age-groups they undertake aortography if there is something in the history which does not conform to the normal pattern of essential hypertension. It is important to exclude as far as possible a phæochromocytoma before aortography, as the injection may provoke a fatal hypertensive attack. In the adult aortography is performed by translumbar puncture of the aorta just above the mouths of the renal arteries: if placed too high the dye escapes into the other major aortic branches and the renal vessels are not plainly seen. In children the dye may be put in retrogradely by catheterisation of the femoral arteries.

Adequate renal circulation may be restored by excising the strictured area and reconstructing the artery by end-to-end suturing, by endarterectomy, or by using the splenic artery as an end-to-side anastomosis. DeCamp and Birchall [3] believe that, with arteries of the size of the renal, free grafts (homografts or synthetic) are best avoided. Freeman [5] followed three cases in which the renal artery was occluded during endarterectomy for aortic thrombosis, the grumous material being accidentally forced into the orifice of a renal artery. In one of the patients severe hypertension developed but subsided after nephrectomy.

Aortography during investigation of high blood-pressure would be advised more commonly if the technique was free of complications. Huger et al.[6] have attempted to minimise the risk of renal parenchymal damage, during the flooding of the kidney with dye, by giving an intra-aortic injection of procaine before the dye. There is evidence that in dogs this gives some protection; but in man this is less clear, and two other factors are much more important—the site of injection and the dose of contrast medium. The constant factor in reported cases of severe bilateral renal damage has been the large dose of concentrated organic iodide used. Renal arteriography should be done with 30 ml. or less of one of the less toxic dyes, such as sodium diatrizoate ('Hypaque'); with such a quantity the risk of parenchymatous damage is very slight.

THESAUROSIS

ANOTHER foreign body is being added to our reticulo-endothelial system's treasure chest. Bergmann et al.[7] report the case of a 27-year-old receptionist who had mild malaise and increasing fatigue for two or three months and was admitted to hospital with a chest radiograph which showed bilateral fuzzy hilar enlargement and reticulated infiltration of all parts of both lungs. A general examination six years before had included a chest radiograph, which had been entirely normal. Physical examination and many tests all yielded normal results except for the chest picture. Resection of the right scalene fat pad produced three moderately firm lymph-glands, one of which yielded no organisms on a wide variety of cultures. Histological examination of the other two showed pronounced hyperplasia of large epithelioid cells with occasional giant cells. Again no organisms could be found, nor was there any fat in the cells of the granulation tissue. There were, however, round granules in the epithelioid cells and interstitial tissue. The only foreign body which could be incriminated was a hair-spray which the patient had used for two years, during the last six months of which her hair had been sprayed twice daily. After the use of the spray was stopped, radiographs of the chest showed partial clearing of the infiltration and lymphadenopathy in two months and a normal picture after four months. Shortly before this, a 22-year-old married woman had been seen as an outpatient because of an abnormal chest radiograph found on routine examination: there was extensive bilateral reticulated infiltration of both lung fields and enlarged lymph-nodes in both hilar regions, but

1. See *Lancet*, 1956, ii, 562; *ibid*, Jan. 25, 1958, p. 201.
2. Scott, H. W., Jr., Bahnson, H. T. *Surgery*, 1951, **30**, 206.
3. DeCamp, P. T., Birchall, R. *ibid*. 1958, **43**, 134.
4. Poutasse, E. F., Dustan, H. P. *J. Amer. med. Ass.* 1957, **165**, 1521; see *Lancet*, Jan. 25, 1958, p. 201.
5. Freeman, N. E., Leeds, F. H., Elliott, W. G., Roland, S. I. *J. Amer. med. Ass.* 1954, **156**, 1077.
6. Huger, W. E., Jr., Margolis, G., Grimson, K. S. *Surgery*, 1958, **43**, 52.
7. Bergmann, M., Flance, I. J., Blumenthal, H. T. *New Engl. J. Med.* 1958, **258**, 471.

the patient was in good health and denied any respiratory symptoms. A pre-employment radiograph two years earlier had been normal. When nothing else could be found to account for the conditions, the patient was asked about inhalants. She had used a hair-spray almost daily, sometimes twice a day, for about three years. Two months after stopping the use of the spray, radiography showed regression, and another month later the picture was virtually normal.

These stories seem simple in retrospect, but consternation was caused by the discovery of an apparently serious, widespread infiltrative process in the lungs in supposedly healthy young women. Bergmann et al. could not determine the exact nature of the particulate matter found in the lymph-glands in the first case. They evaporated to dryness 20 ml. quantities of hair-spray, suspended the residues in saline solution, and injected the suspension subcutaneously into guineapigs. One to two months later the sites of injection showed granulomatous lesions in which particulate matter was found in foam cells, and similar granules were found sometimes in liver, spleen, or lung. The reaction was typical of the macromolecular substance reaction [8] given by the various natural and synthetic resins used in cosmetics as well as for many other purposes. While most of these substances are chemically inert, and relatively large quantities may be stored in the reticulo-endothelial system without affecting function, there is always the possibility that one may be carcinogenic [9]; and the diagnostic difficulties to which they may give rise should be generally recognised.

DETERMINING PROTEINS IN LOW CONCENTRATION

THE most accurate methods for determining the relatively small amounts of protein that may be present in biological fluids, such as urine and cerebrospinal fluid, involve either gravimetric estimation after precipitation, or estimation of the nitrogen content of the precipitated and washed protein by the micro-Kjeldahl technique. But these methods are time-consuming and thus unsuitable for use in busy routine laboratories. All the methods in routine use sacrifice, to some extent, accuracy for speed. They depend either on estimation of the volume of the precipitated protein, as in the unsatisfactory Esbach method, or, better, on precipitation of protein and comparison of the resulting turbidity with turbidimetric standards, or, better still, on comparison of the colour developed in the biuret reaction with that developed by a standard biuret or standard protein solution. This last method usually gives an answer within 5% of that given by a micro-Kjeldahl technique.[10] The error of the turbidimetric methods is usually less than 10%, but occasionally may be as high as 20%.[11] The Esbach method may give results varying from half to twice the true amount.[12]

Closs [13] has described a new reagent for precipitating urinary proteins, which are then determined turbidimetrically in a photoelectric colorimeter. The reagent is an 0·2% solution of sodium polythionate brought to a pH of about 2. 1 ml. of urine is mixed with 10 ml. of reagent in the cold, and the turbidity produced after 30 minutes can be assessed qualitatively or estimated quantitatively. The reagent is made freshly each week from a stock solution, which will keep indefinitely at room-temperature. Closs finds that, qualitatively, the method is as sensitive as Heller's test, which will detect 7 mg. of protein per 100 ml.[14] Quantitatively the method, applied to urinary protein, appeared to agree somewhat more closely with the micro-Kjeldahl technique than is usual with turbidimetric procedures. Its usefulness in determining the protein content of other biological fluids has yet to be ascertained.

This method has certain small advantages, in that the amount of fluid required is 1 ml. or less, the degree of dilution reduces the error that may arise with initially turbid urines, no heating is necessary, and interfering precipitations or colorations are rare.

8. Hueper, W. C. *Arch. Path.* 1942, **33**, 267.
9. Hueper, W. C. *Cancer*, 1957, **10**, 8.
10. Hiller, A., Greif, R. L., Beckman, W. W., Plazin, J. *J. biol. Chem.* 1948, **176**, 1421.
11. Varley, H. Practical Clinical Chemistry. London, 1954.
12. Peters, J. P., Van Slyke, D. D. Quantitative Clinical Chemistry; vol. 2. London, 1932.
13. Closs, K. *Scand. J. clin. Lab. Invest.* 1957 **9**, 349.

SURVEY OF CHILDREN

IT is a matter of common clinical experience that infants and children from poor homes do not thrive as well as the socially better favoured. But the precise effects of social conditions on physical and mental health and development are not easily defined. A study by Douglas and Blomfield [15] provides much long-awaited material.

The starting-point of the work was the investigation by the Population Investigation Committee and the Royal College of Obstetricians and Gynæcologists into the circumstances and costs of all confinements in Great Britain during the first week of March, 1946. Of the 14,000 families involved in that inquiry [16] 5000 children were selected for longitudinal study, and it is their life-stories up to the age of 5 that Douglas and Blomfield are now concerned with.

These children spent their early years in the unsettled post-war era and have been subject to the manifold social changes of the time, not least of which was the inception of the National Health Service when they were 2. During the survey period (1946–50) housing conditions steadily improved, and many of the families moved upward in the social scale. This background has to be remembered in assessing some of the findings of the survey, or in extrapolating conclusions for present-day needs.

Poor social conditions showed differing effects according to the age of the child. In the perinatal period such conditions were associated with an increase in prematurity and neonatal death, in infancy with early and severe respiratory infections, and in childhood with significant depression of growth. At all ages the direct cause of socially determined disorders was "maternal inefficiency" with poverty, overcrowding, and large families appearing as predisposing factors. The report shows clearly that successful mothering of a large family, where the housing conditions are poor and the budget is slender, requires care, resourcefulness, education, and supportive advice. The best showing was made by the families of "black-coated workers". As a group they are not materially better favoured than skilled workers; but by care, ability, and utilisation of child-welfare services they achieve not only favourable development for their children but also often fulfilment of their social aspirations.

Douglas and Blomfield feel that "the social and educational approach" offered by the local-authority

14. Harrison, G. A. Chemical Methods in Clinical Medicine. London, 1957.
15. Children Under Five. By J. W. B. DOUGLAS and J. M. BLOMFIELD. London: Allen & Unwin. 1958. Pp. 177. 21*s*.
16. Maternity in Great Britain. London, 1948. See *Lancet*, 1948, ii, 813.

child-welfare services has done much to improve standards of maternal care, and that this is "still of primary importance in the saving of infant life". They urge that the existing services be retained, with some reorganisation, saying that the time is not yet ripe for their disbandment. But it must be noted that in the survey material the incidence of fatal illness was highest before treatment by family doctors became available to all without fee under the N.H.S.; that the incidence of infections (without regard to severity) in all but the highest social groups was no lower among the "careful" mothers; and that schoolchildren and chronically infected adults were important spreaders of family infections. Moreover, the infant-welfare clinics failed to attract the mothers most in need of their services.

Other matters no less important are illuminated by the study. The possible ill effects of separation, family break-up, and the employment of mothers were investigated. Although the inquiry was necessarily superficial, no convincing evidence appeared that these had any adverse effect on the physical or emotional wellbeing of the children. There was some suggestion that when the separation involved admission to hospital neurotic symptoms increased. Victims of accidents tended to be superior children, indicating the inevitable risks incurred by those with a healthy body and adventurous spirit. The findings on toilet-training confirm the impression that girls more quickly acquire continence than boys. Enuresis is strongly associated with poor maternal care, and early pot training within a secure home is followed by the most rapid attainment of sphincter control. This is contrary to the often-expressed view that early potting is a manifestation of coercive training likely to be followed by failure and neurosis.

The Institute of Child Health (University of London), the Society of Medical Officers of Health, and the Population Investigation Committee are to be congratulated on sponsoring this study. It is good news that the Nuffield Foundation have made a grant to enable the study to continue until the children reach the age of 15.

THE BONE CRYSTAL COMPLEX

PROGRESS in work on the structure of bone has been reviewed by McLean.[1] The histological unit is the osteon—the Haversian system with canal, concentric bony lamellæ, cells, and canaliculi—150 μ in diameter and several millimetres in length. Throughout adult life there is a constant process of "Haversian remodelling" of compact bone; at any given time a certain amount of labile reactive bone—about 1% of the total mass of bone—is present, and it is this 1%, actively exchanging substance with the surrounding tissue-fluids, that makes bone a living and not a dead material. The organic unit of bone is the collagen fibril—800Å made up of macromolecules secreted by the osteoblast. The inorganic unit is the rod-shaped bone crystal—$3Ca_3(PO_4)_2.Ca(OH)2$, hydroxyapatite—about 200Å long and 75Å in diameter. The crystals are oriented in the long axis of the collagen fibril and packed round the region of the periodic cross-banding, leaving uncovered gaps along the fibril.[2] Owing to their minute size the crystals have an enormous surface-area per unit of mass—of the order of 200–300 sq. m. per gramme. It is this expanse of crystal surface that gives bone its most important non-mechanical function—the "homeostatic regulation of the ionic composition of the circulating fluids of the body, and a reservoir of the calcium ion".[3]

Around each crystal, and partly bound to its surface, is a layer of hydrated ions together with a "shell" of water. Each gramme of crystal, it is claimed, can hold 0·8 g. of water in this way, and so there is a greater volume of water than crystal. Any ion from the surrounding fluid can diffuse into the water shell. The layer of hydrated ions—calcium, phosphate, and hydroxyl—is constantly exchanging with similar ions in the surface layer of the crystal lattice, and there is a much slower ionic interchange between the surface and the interior of the crystal. Of the ions circulating in the body-fluids K^+ and Cl^- can penetrate only as far as the hydration shell. Na^+, UO_2^{++}, CO_3^{--}, and citrate^{---} can displace calcium phosphate or hydroxyl ions from the crystal lattice surface, while Ca^{++}, Sr^{++}, Ra^{++}, PO_4^{---}, and F^- can penetrate into the interior of the crystal structure. Such ionic movements take place wherever body-fluids are in contact with the crystal complex of reactive bone. As the crystals age and increase in number, they displace the water and so become dehydrated and inert like natural mineral deposits.

Some quantitative data on interchange of ions between blood and bone have been obtained by means of radioactive isotopes such as ^{45}Ca, ^{32}P, and more recently ^{47}Ca. External counting gives approximations of the magnitude and rate of this exchange. For instance, it is known that in young animals the total calcium in the blood (10 mg. per 100 ml.) is replaced every minute.

Equilibrium between the blood and the reactive bone of the mineralising osteon is maintained by constant adjustment through ionic interchange between bone, extracellular fluid, and serum. This immediate control mechanism may, it is believed, also involve bone-cell activity, with the formation of citric acid, which acts as a carrier and conveys calcium from bone to blood-stream. The level of citric acid in bone is influenced by parathyroid and vitamin D[4].

In addition to the minute-by-minute regulation the parathyroid glands are essential for the maintenance of the plasma-calcium at the physiological level of 10 mg. per 100 ml. If the parathyroid glands are removed the calcium level falls to 7 mg. per 100 ml., and with parathyroid hyperactivity it may rise to 15 mg. per 100 ml. Parathyroid reaction to changes in calcium-ion concentration is effective in terms of hours, compared to the more immediate results of ionic transfers, and is brought about by the dissolution of mineral from the stable bone—probably by the activity of mobilised osteoclasts.[5]

More work on the electron microscopy of bone is required—particularly with regard to the disposition of the bone crystals, the fine structure of the ground substance, and the study of radio-isotopes at the level of ultrastructure.

Dr. DEREK STEVENSON has been appointed secretary of the British Medical Association in succession to Dr. ANGUS MACRAE, who reaches retiring age in November. Dr. Stevenson has been a deputy secretary since 1948.

The next session of the General Medical Council will open on Tuesday, June 3, at 2.15 P.M., when Sir DAVID CAMPBELL, the president, will deliver an address. The Medical Disciplinary Committee will meet on Wednesday, June 4, at 11.30 A.M.

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Public Health

SMALLPOX IN TOTTENHAM—1957

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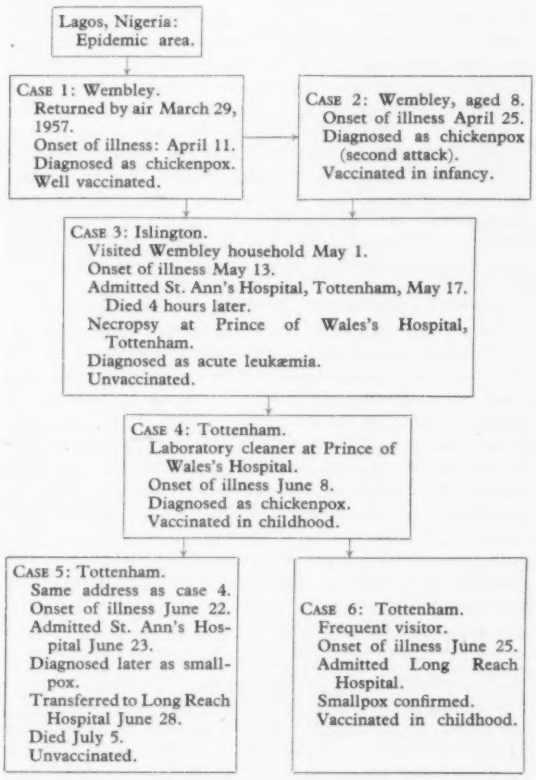
LOOKED at in retrospect and in the accompanying graphic chart, the smallpox outbreak in Tottenham in the summer of 1957 appears small and neatly disposed of as an epidemiological study. This does not mean, however, that the incident was not a full-scale exercise in accepted methods of investigation and control; or that it was without clinical, social, and administrative features of special interest. What may not be so easy to explain is why the disease did not spread more widely despite the measures taken.


Lagos, Nigeria: Epidemic area.
CASE 1: Wembley. Returned by air March 29, 1957. Onset of illness: April 11. Diagnosed as chickenpox. Well vaccinated.
CASE 2: Wembley, aged 8. Onset of illness April 25. Diagnosed as chickenpox (second attack). Vaccinated in infancy.
CASE 3: Islington. Visited Wembley household May 1. Onset of illness May 13. Admitted St. Ann's Hospital, Tottenham, May 17. Died 4 hours later. Necropsy at Prince of Wales's Hospital, Tottenham. Diagnosed as acute leukæmia. Unvaccinated.
CASE 4: Tottenham. Laboratory cleaner at Prince of Wales's Hospital. Onset of illness June 8. Diagnosed as chickenpox. Vaccinated in childhood.
CASE 5: Tottenham. Same address as case 4. Onset of illness June 22. Admitted St. Ann's Hospital June 23. Diagnosed later as smallpox. Transferred to Long Reach Hospital June 28. Died July 5. Unvaccinated.
CASE 6: Tottenham. Frequent visitor. Onset of illness June 25. Admitted Long Reach Hospital. Smallpox confirmed. Vaccinated in childhood.

Foremost in the experience gained was the sense of close cooperation which existed from the moment the first case was suspected, and remained throughout subsequent events, between the Ministry of Health, the North East Metropolitan Regional Hospital Board, the Virus Reference Laboratory, Colindale, the members of the panel of smallpox opinion, local hospitals' medical and administrative staffs, general medical practitioners, and the medical officer of health's department.

The Early Stages

By telephone at 10.15 A.M. on Friday, June 28, 1957, the medical officer of health (G. H. H.) was informed by the consultant physician for infectious diseases (G. D. McK.) at St. Ann's General Hospital, Tottenham, of a case of suspected smallpox in that hospital.

An unvaccinated boy aged 6 (case 5), had been admitted to the poliomyelitis unit of the hospital on June 23 with a history of backache, fever, abdominal pain, and vomiting. On admission he was ill, with abdominal tenderness and guarding, and a temperature of 102°F. He had general ichthyosis and superimposed patches of eczema. The practitioner's provisional diagnosis of poliomyelitis was not borne out by this further examination, which suggested an acute abdominal emergency. At laparotomy the appendix (which was removed) was found to be normal, but the mesenteric glands were seen to be enlarged. During the next three days the patient remained febrile and ill, and there was some bleeding around the abdominal wound. On admission a few macules had been noted in the interscapular area, and by June 27 it was evident that he had a rash, predominantly papular and peripheral, besides the chronic skin condition. At the time eczema herpeticum was thought to be more likely than smallpox, but skin scrapings and fluid from one or two vesicular lesions were sent to the Virus Reference Laboratory, Colindale.

Next morning there was a striking change in the child's appearance. The rash was vesicular and becoming confluent, and smallpox could be confidently diagnosed on clinical grounds. Following the telephoned report of these facts to the medical officer of health, an immediate consultation was held at the hospital, when it was agreed to call in a second member of the panel of smallpox opinion (Dr. A. M. Ramsay) and to report the situation by telephone to the principal medical officer of the epidemiology division of the Ministry of Health (Dr. W. H. Bradley). Before noon both Dr. Ramsay and a medical officer from the Ministry (C. G. N.) had arrived at the hospital and agreed to the clinical diagnosis of smallpox. Arrangements were made for the immediate transfer of the patient to Long Reach Hospital, Dartford, under the care of the late Dr. M. Mitman. During the same day a preliminary report was received from the director of the Virus Reference Laboratory (Dr. F. O. MacCallum) that the complement-fixation test was strongly positive for variola-vaccinia. On July 5 the boy died. Throughout his stay at St. Ann's Hospital he had been barrier-nursed in single cubicles—for the first four hours in the poliomyelitis unit and for the remainder of the time in another cubicle block.

Before the clinical diagnosis had been confirmed, his parents had been interviewed by the chief public health inspector (Mr. E. T. Jenkins) and detailed information of the members of the household and their occupations obtained. The father, a bus conductor, had reported at his depot that morning; since this was an obvious risk the medical officer of health at once spoke on the telephone to the chief medical officer of the London Transport Executive.

This early inquiry into the home circumstances revealed a further case of smallpox, the boy's grandmother (case 4) living in the same house and by this time convalescent.

This patient, vaccinated in childhood and now aged 61, had fallen ill on June 8; a rash (which was thought by her doctor to be that of chickenpox) developed on June 12. She was seen by two of us (G. H. H. and C. G. N.) in consultation with Dr. Ramsay. The clinical findings were equivocal but consistent with a modified attack of smallpox. In view of the satisfactory vaccinal state of the rest of the household, now refreshed by further vaccination, it was considered justifiable to await the result of laboratory examination of scrapings taken

from the most suitable of the few remaining lesions. To complete this patient's subsequent history, the complement-fixation test was reported as positive on the following day, when she was removed to Long Reach Hospital, and a positive egg culture was reported as further confirmation two days later. This patient continued an uninterrupted convalescence and was in due course discharged from hospital.

From the chief public-health inspector's inquiries, it was learned that the patient was employed as a domestic worker in the pathological laboratory at another hospital in the Tottenham group of hospitals—a circumstance which it was felt must afford some explanation of her infection. (This matter is referred to later in the account of the outbreak.)

ACTION TAKEN AT ST. ANN'S HOSPITAL

It was agreed that immediate responsibility for vaccination and other control measures at St. Ann's Hospital should be undertaken by one of us (G. D. McK.) who had arranged for the supply of enough lymph to vaccinate the whole complement of the hospital, and for the preparation of a list of all primary contacts on the staff with their vaccinal history and that of the other patients on the two wards in which case 5 had been nursed.

There were 42 primary contacts among the staff and 31 patients in the two wards; only 6 of the patients had been vaccinated. Permission to vaccinate these children was sought by telegram and all but 2 were vaccinated within twelve hours—the remaining 2 being vaccinated next day when permission was received.

When we discovered the inadequate vaccinal state of the children nursed in the cubicles adjacent to case 5, we decided to give them hyperimmune anti-variola gamma-globulin forty-eight hours after vaccination, and accordingly these 15 children each received 5 ml. All 42 primary contacts among the staff had been vaccinated at some previous time, but in 9 there was no satisfactory proof of recent *successful* vaccination, and each was therefore given 10 ml. of hyperimmune gamma-globulin. Our findings agree with the observation of Kempe et al. (1956) that administration of hyperimmune gamma-globulin (twenty-four hours after vaccination in their series) does not interfere with the course of vaccination, for all 24 of our vaccinations were successful. Vaccination of the remaining hospital patients and staff (about 1000 persons) was started on June 29, and continued throughout the early part of the following week, revaccinations being done where necessary.

The hospital was closed for admissions and discharges on Friday morning (June 29) and visiting was restricted to those seriously ill. During the weekend a zone of isolation was set up (on the " hospital within a hospital " principle) using one previously empty ward, which was made into living quarters, and the two wards where case 5 had been nursed. This area was roped off, and all 26 primary contacts among the resident staff of the hospital were isolated within it. Entrance was restricted to the infectious-disease physicians, the senior administrative nurses, physiotherapists, and engineers. Protective clothing was worn (cap, mask, gown, and boots). Food was supplied in destructible containers and all combustible material was removed to the incinerator in bins on a trolley reserved for the purpose.

On July 1 a further ward was prepared to receive staff with vaccination reactions and doubtful illnesses requiring isolation and investigation. This proved a valuable adjunct, and during the fourteen days it remained open 8 patients were admitted.

St. Ann's is a general hospital of 520 beds, of which 120 form an infectious-diseases unit. There is normally considerable interchange of staff both between this unit and other departments and between the hospital and the other hospitals in the group. By re-allocation of duties it was readily possible to avoid or reduce such interchange to the minimum, but the situation within St. Ann's Hospital of the central laundry for the whole group gave rise to much concern. It was found that no articles used by case 5 had been sent for laundering, and it was therefore decided to maintain the existing laundry services, save that the zone set aside for smallpox contacts would be provided with a washing-machine for each ward.

No material therefore left the smallpox zone, except that destined for the incinerator.

The closure of the group laundry would have caused considerable disruption in the work of all the contributing hospitals—so much so that the group laundry manager (Mr. C. H. Adams) subsequently followed up the matter elsewhere, with the cooperation of one of us (C. G. N.), and we understand that military mobile laundry units of varying capacities can be hired to meet such an emergency.

It seems that the precautions were adequate, for there was no secondary case in the hospital or within the group, and with the uneventful effluxion of the sixteen days' surveillance it was possible to determine all isolation measures on July 15.

Public-health Action

Reporting of Outbreak

During the afternoon of the first day, an official telegram was sent to the Ministry of Health confirming the earlier telephone message; the county medical officer was notified, the senior administrative medical officer of the North East Metropolitan Regional Hospital Board was informed of the position, and a circular letter (thereafter issued daily) stating the situation was sent to all general medical practitioners in the borough and to medical officers of health in adjoining local authorities. The chief medical officer of the Ministry of Health notified all medical officers of health in the country and port medical officers of the progress of the outbreak by circular letters issued on June 28, July 1, and finally on July 5.

Contacts of Case 5 before Admission to Hospital

Case 5 had been attending school until Friday, June 21. The school was visited before closure for the weekend, and duplicate registers and names and addresses of staff were obtained for purposes of offering vaccination or revaccination. A list of recent visitors to the patient's home was prepared, including relatives, friends, neighbours, and tradesmen. A list of patients since conveyed in the same ambulance was obtained from the local depot. Arrangements were made with the Central Public Health Laboratory, Colindale, for the supply of 2000 capillary tubes of calf lymph for immediate vaccination or revaccination of primary contacts and the staff of the health department.

Public Relations

On Saturday, June 29, a joint statement was issued to the Press by the hospital and public-health authorities.

" In view of the suspected case of smallpox transferred from St. Ann's General Hospital on the 28th June, the hospital has ceased to admit or discharge cases. Members of the staff who were in direct contact with the patient have been confined within the hospital or if non-resident asked to remain within their own homes. The remainder of the staff of the hospital will continue to work in the usual way and are not confined to the hospital. All contacts of the suspected case will have been vaccinated during the week-end. The clinical diagnosis of smallpox has been confirmed and a relative of the patient has been admitted to a smallpox hospital as a suspected case. There is *no* indication for mass vaccination of the general

public. All those who might receive immediate benefit from vaccination are being visited."

Vaccination within the Borough

A sustained effort followed on Saturday afternoon and Sunday to secure the vaccination of all known contacts in their own homes. For this purpose the deputy medical officer of health organised three parties comprising doctor, health visitor, and public-health inspector, to carry out house-to-house vaccination of all contacts. Concurrently the deputy area medical officer and area chief clerk opened an emergency vaccination centre at Chestnuts, St. Ann's Road, which was continuously staffed over the weekend and for as long as necessary thereafter.

Hyperimmune Gamma-globulin

Since doubts were felt about the effectiveness of vaccination so late after contact with the primary case, it was decided to reinforce vaccination with anti-variola gamma-globulin. Application was at once made to the Ministry of Health, and half the available stock was released. This amount was divided equally between the hospital and public-health departments. A dose of 10 ml. (1000 mg.) for an adult and 5 ml. (500 mg.) for a child was given to the previously unprotected primary contacts. In practice it was found that much patience was needed in preparing the injection. The protein proved extremely difficult to get into solution or suspension, and each dose took about ten to fifteen minutes to prepare.

Origin of the Infection

In midsummer, in a patient with no known history of recent arrival from, or links with, those parts of the world in which smallpox is endemic, a report of smallpox must immediately arouse two considerations in the minds of those in the central government department concerned with smallpox—that there has been a misdiagnosis (for smallpox in this country is nearly always imported during our winter), or that if the diagnosis proves correct, the disease must have been present in the country, unsuspected, for some little time, and that evidence of this can be found if search is made in the right quarter.

In the incident now related examination of case 5 had left no doubt as to the diagnosis. No case of smallpox had been notified for some three years, and there had been no recent suspicion of the disease. It was quickly established that there was no link or association between cases 4 and 5 and any foreign country. Few could have led a more circumscribed existence than the widowed grandmother, and the boy's (case 5) small world did not extend outside his part of the borough. By inference, therefore, it seemed wellnigh certain that a study of recent and not-so-recent death certificates would provide a lead to the source of infection. The complete absence of any reported cases of smallpox elsewhere in the country suggested either that the earlier missed case (or cases) must have been modified clinically and have arisen in a patient who was himself vaccinated and belonged to a small well-vaccinated group, or that in this earlier case the patient must have died before his disease had reached the infectious stage. The search was therefore at once narrowed to a retrospective inquiry for someone who had died in the early stages of hæmorrhagic smallpox, and the presumption was that the cause of death most likely to have been assigned would be leukæmia. Accordingly, at the suggestion of one of us (C. G. N.) a scrutiny was made of all death returns for the past four months, and 4 deaths during that time seemed worthy of investigation, the stated cause of death in all cases including the term "leukæmia". Further inquiries readily disposed of any possible suspicion in the first 3 cases, late residents of Tottenham; but in the case of the fourth (case 3), a licensee lately of the adjoining borough of Islington, an interview with the widow revealed that she and her late husband had visited his brother (case 1) in Wembley, who, with his daughter (case 2, aged 8) had been suffering from "chickenpox". Thirteen days later case 3 became very ill and was admitted late at night to St. Ann's General Hospital.

This patient had had an acute febrile illness with hæmaturia, massive purpura, and an enlarged liver and spleen, from which he died four hours after admission. The leucocyte-count was 28,000 per c.mm., 48% of which were primitive cells of the polymorph series. *Hæmophilus influenzæ* and pneumococci were recovered in large numbers from a blood-culture. As the cause of death was uncertain, the coroner was notified and the body removed to the Prince of Wales's General Hospital for necropsy. The purpuric condition, with a leukæmoid blood film, suggested a diagnosis of acute leukæmia, but in retrospect he must be regarded as a case of hæmorrhagic smallpox.

Necropsy specimens were sent to the pathology laboratory, where it may be assumed that the cleaner (case 4) became infected. The brother-in-law (case 1) of Wembley, a well-vaccinated subject, had returned to this country by air from Lagos, Nigeria, on March 29, and on April 11 had developed a mild illness diagnosed at the time as chickenpox. His daughter (case 2), aged 8, vaccinated in infancy, became ill on April 25 also with a mild attack of "chickenpox", but was said to have had a previous attack of chickenpox. In retrospect both father and daughter probably had smallpox, and were the source of infection of case 3.

Progress of Outbreak in the Borough

Throughout Sunday, June 30, the immediate focus of attention was on the primary contacts. Systematically the lists were worked through and gamma-globulin and vaccination, or revaccination alone, was given to the members of the public at greater risk—there were no refusals.

A girl, aged 11, not a contact of case 5, was sent on suspicion to Long Reach Hospital, but later proved to have chickenpox. An aunt of case 6, who had been vaccinated in infancy and had nursed case 4 (her mother), became unwell and the following day was admitted to Long Reach Hospital; smallpox was later confirmed. In due course she made a slow but uneventful recovery. The engineering firm where case 6 worked was visited and the staff were advised to accept vaccination. Other primary contacts of special mention, living in the neighbourhood, included a married couple and their daughter, the wife of a U.S.A.F. airman, who was expecting her first baby at the time. She was given gamma-globulin intramuscularly. Later in the week she was admitted to an isolation cubicle at the American Hospital, Ruislip, for a normal delivery.

The public-health inspectors meanwhile continued to obtain names and addresses of groups of persons at special risk (e.g., laundry workers who might have handled contaminated linen from families involved), and directed them to the emergency vaccination centre. Gradually the public at large pressed in ever-increasing numbers for vaccination. These were diverted to their own general medical practitioners, who obtained supplies of calf lymph held at the Town Hall. In the meantime vaccination of children at the school attended by case 5 proceeded well, and was undertaken by the mobile teams

of doctors and health visitors. The classroom of the patient, and the rooms at the houses where his and other cases of smallpox arose, had been sealed and disinfected. Vaccination or revaccination of the ambulance workers at the Edmonton depot was arranged by the medical officer of health of Edmonton.

On Tuesday and Wednesday, July 2 and 3, routine home visiting of primary contacts was continued, and many cases needed daily observation, including hospital out-residents and special cases referred by doctors in the district and health visitors—many of these were reactions to vaccination. This surveillance continued for sixteen days.

Notification of Chickenpox

Because of the close contact with local doctors, who agreed to report all cases of chickenpox, it seemed unnecessary in the early stages to seek action under Section 147 of the Public Health Act, 1936.

General Liaison

Under the direction of the chief clerk, rapid compilation of records and distribution of information became the first task of the public-health officers.

Other work was put aside except for matters of absolute urgency, and the whole staff concentrated on control of the outbreak. This called for sustained work until late at night throughout the first weekend and following week. Bulletins to general practitioners and adjoining medical officers of health were sent out daily. Lists of contacts, which arrived from St. Ann's Hospital and other sources, were classified according to the districts where they lived. The medical officers of health of the districts concerned were first telephoned and the information was confirmed the same day by letter. For those living within the borough, contact sheets were made out and passed to the district public-health inspectors who undertook surveillance for sixteen days.

Besides the information which had to be telephoned out, there were continuous incoming telephone messages and inquiries. As a result, despite six telephone extensions in the department there was often an acute shortage of telephone facilities. It was also necessary to arrange for the switchboard operators to stay on duty to deal with calls which continued throughout the evenings.

National Insurance Benefits

None of the smallpox patients was a contributor for National Insurance benefits, but some primary contacts were able to claim upon the certificate of the medical officer of health.

A special emergency procedure, laid down in a Ministry of Pensions and National Insurance memorandum for dealing with claims arising from an outbreak of smallpox, relieves the local national insurance office of any direct contact with the claimants. The effect of this was that the public-health department was called on to act as agent for all the claimants. It was thus necessary to arrange for the contacts to complete various benefit-claim and authorisation forms, which were retained in the department, and from these to complete weekly certified summaries, which were forwarded to the Ministry of Pensions and National Insurance. A lump sum covering the benefits accruing was paid weekly to an officer in the public-health department, who was responsible for its distribution to the claimants.

Compensation for Loss of Earnings

Section 51 of the Tottenham Corporation Act, 1952, enabled the local authority to compensate primary contacts for loss of earnings resulting from their exclusion from work. The Corporation agreed that compensation should be paid to the extent of making up the difference between the earnings lost and the national insurance benefits received. Fortunately the early restriction of the outbreak so limited the number of primary contacts that expenditure on this account did not exceed £100.

Supplies of Goods to Households in Isolation

A particular difficulty was that whole households had become primary contacts and were subjected to isolation within their homes. This meant there was nobody available to do essential shopping, and in one or two cases the families had no ready money to pay for the goods needed. A health visitor was, therefore, asked to visit these families daily and to do any necessary shopping on their behalf. Recognition is due to the local tradesmen for their ready cooperation in providing goods on credit pending settlement of the families' claims for National Insurance benefit.

Distribution of Calf Lymph

Lymph was made available to doctors at the Town Hall. The demand grew rapidly after the first weekend, and altogether 11,500 units were obtained for use by family doctors and at the public vaccination centre. 4291 units were issued to medical practitioners and the remainder used by the local authority staff. A certain amount of wastage resulted from the use of lymph supplied in multiple units of 10, 25, and 50.

Summary

An outbreak of smallpox in Tottenham in 1957 is described.

The disease probably entered the country when a man incubating it returned from Lagos. 6 probable or confirmed cases were traced; 4 patients, who had been vaccinated, survived, and 2, who had not been vaccinated, died.

Anti-variola gamma-globulin was used to give additional protection to the previously unvaccinated primary contacts. No secondary case arose within this group, and it seems that this may have in part been due to the protection afforded by the gamma-globulin.

We wish to express our appreciation of the part played by all public-health and hospital staff, and particularly to thank Dr. J. Epsom and Dr. J. M. Medlock.

REFERENCE

Kempe, C. H., Berge, T.O., England B. (1956) *Pediatrics*, **18**, 177.

No Smallpox in Lincolnshire

Our report last week of a confirmed case of smallpox at Scunthorpe was unfortunately incorrect. A clinical diagnosis of smallpox was made in a 30-year-old Arab and he was admitted to Laceby Hospital. Laboratory tests were negative, however, and further inquiries disclosed that the man had been in close contact with children suffering from chickenpox.

Scotland in 1957

According to preliminary figures[1] in Scotland the birth-rate last year was 19·0 per 1000 population, compared with 18·5 per 1000 in 1956. The stillbirth-rate—24 per 1000 live and still births—was the same as in 1956. The death-rate was 11·9 per 1000, which is 0·1 below the rate for 1956. The maternal-mortality rate (as in 1956) was 0·5 per 1000 live and still births. The infant-mortality rate (as in 1956) was 29 per 1000 live births; and the neonatal death-rate was 20 per 1000, which was 1 above the rate for 1956. The death-rate from tuberculosis (all forms) was 14 per 100,000—9 below the five-year average.

1. Quarterly Return of the Registrar General, Scotland: Births, Deaths, and Marriages registered in the quarter ended Dec. 31, 1957; also preliminary return for the year 1957. H.M. Stationery Office. 1958. Pp. 40. 2*s*. 6*d*.

Conferences

STRESS DISORDERS

A CONFERENCE organised by the Society for Psychosomatic Research was held in London on May 2–4.

Relation of Stress to Three Groups of Disorders

ESSENTIAL HYPERTENSION

Dr. JOHN HAMBLING (Canterbury) described the correlation observed in the labile hypertensive between fluctuations of diastolic blood-pressure and discussion of emotionally charged topics. Suppressed rage and resentment were the most potent diastolic pressor factors. To verbalise or act out these feelings could produce a dramatic fall in pressure. The potential hypertensive usually had at least one parent who was dominating or driving, and he tended to see his life situation in terms of dominance-submission, being ultrasensitive to any authoritarian element.

ITCHING SKIN DISORDERS

Dr. BRIAN RUSSELL outlined the neurophysiology and biochemistry of normal and pathological itching. It might ultimately be found that emotionally activated itching had a biochemical mechanism, but this was still unknown. Itching sensations were conveyed by the non-medullated C sensory nerve-fibres and were a form of weak protopathic pain. A stimulus of greater intensity eliminated the itching and replaced it by burning pain, often more tolerable. This itch→burning pain→itch sequence might explain the maintenance by scratching of some dermatoses. It was often difficult to establish the temporal link between "stress" and itching skin disorders without prolonged observation. Dr. Russell drew attention to the psychological significance of the terms associated with itching and irritating skin conditions. In his experience itching skin disorders were more often associated with aggressive than with libidinous impulses. Pruritus might occur when a person feared to give expression to repressed or guilt-laden drives.

GASTROINTESTINAL DISORDERS

Dr. DESMOND O'NEILL prefaced his remarks with the reminder that disease should be considered in terms of reaction patterns rather than of systems; a new taxonomy was needed, and what Dr. Michael Balint called "the pathology of the whole person" had still to be written. The gastrointestinal system reacted to stress in many different ways. Overeating, leading to obesity, was the reaction of some patients to feelings of depression and discontent. Under-eating might alternate with this, or might progress to anorexia nervosa because of guilt about eating. Recurrent vomiting in children was another familiar reaction. In his experience duodenal ulcer was a stress disorder, gastric ulcer not always so. Another syndrome he called "abdominal discontent": the patient felt "fed-up," and complained of heartburn, flatulence, and discomfort, and had sexual difficulties. Most recurrent abdominal pain of which the cause was known could be related to stress. Diarrhœa, constipation, and ulcerative colitis were other disorders of the gut in which the relation to stress was well recognised.

Dr. PHILIP HOPKINS said that, in his general practice, of 259 patients with stress disorder 45 had gastrointestinal symptoms. These had responded to simple psychotherapy with improvement, maintained over five years' observation.

Dr. NICOLAS MALLESON said that of 500 university students to whom he had given a questionary 150 had reported some disorder of the gut. Stress disorder seemed to show itself more commonly in this system than in any other. He thought this might be because the human stomach, as was suitable to a ground ape, secreted gastric juices all day long. We were built for a casual omnivorous diet, but in modern life we ate like carnivores —alternately gorging and fasting.

Experimental Stress

STRESS IN AVIATION

Group-Captain V. H. TOMPKINS (Portsmouth) said that the effect of stress on the airman had been the subject of discussion since the earliest days of flying. As Dr. Denis Williams had pointed out, the stresses to which the nervous system of the airman had to become adapted were threefold: the way of life, the job, and the physical conditions of the job (speed, radial acceleration, oxygenation, cold, &c.). It had been found in practice that in these physical conditions there was no specific stress factor comparable in its effects to the psychological factor of fear. Fear was considered responsible in 99·6% of a series of 2200 flying crew who broke down with neuroses. Somatic reactive stress symptoms were usually mild or transient in airmen, who were highly selected. He had the impression that men with mild obsessional traits were more apt to show such symptoms.

EXPERIMENTAL STRESS IN MAN

Dr. D. RUSSELL DAVIS (Cambridge) discussed the problems encountered by the psychologist attempting to study this subject. Pavlov's dogs, posed an insoluble problem, would develop "experimental neurosis"; but the man had a wider range of solutions, his interest was less easily engaged, and he readily "withdrew". Methods using non-specific stimuli such as electric shocks or loud noises yielded little of importance. He had overcome these difficulties in some war-time studies, subjecting pilots to tests of their newly acquired skills. He paid tribute to the work of Kurt Lewin and Zeigarnik. Laboratory methods, however, remained unsatisfactory for the study of sustained stress: its effects were better observed in natural experiments and by clinical methods.

ANIMAL OBSERVATION

Dr. R. A. HINDE (Cambridge) spoke of some studies of the behaviour of animals in nature under stress. Short-term autonomic responses to stress—for example, when two conflicting tendencies were present—might result in a compromise form of behaviour or in a "displacement activity". Many "displacement activities" were now thought to depend on autonomic response to one or other conflicting tendency. He also discussed the theories about the population cycles of certain wild animals, and why after a peak period the population may fall rapidly or "crash". Some workers had described a syndrome marked by liver atrophy and hypoglycæmia in animals that died during the crash period. Selye had pointed out that this "shock disease" resembled a disease of adaptation. This agreed with the finding of a direct relation between adrenal weight and population density in mice in the laboratory.

PHYSIOLOGY OF STRESS RESPONSES

Dr. W. J. H. BUTTERFIELD presented the results of his studies of volunteers receiving oral hydrocortisone and of 25 burned patients. Most of the metabolic changes

caused by burns could be mimicked by hydrocortisone. The size of the metabolic response was roughly proportional to the stress, measured by the percentage of the body burned. The liver's failure to metabolise adrenal steroids might play an important role in metabolic changes after burning. A further effect of this was the development in some burned patients of diabetes of Cushing-disease type; this might later become insulin-dependent.

Stress and Occupation

STRESS DISORDER IN SOCIETY

Dr. F. M. MARTIN (Edinburgh) said that epidemiology had so far contributed little to the study of stress disorder. This was because the two prerequisites of accurate counting and significant analysis of data were so rarely fulfilled. There was need for the sociological as well as the clinical approach in gathering and evaluating data. When rapid changes were in progress in a community the sociologist would focus attention on the stresses this might cause. In more stable societies he would look for dysfunctions in the organisation of society and the effect on the individual of his quest for culturally sanctioned goals. There was a danger of circular reasoning. He did not think the concept of " the stress and strain of Western civilisation " very helpful. Hypertension fitted in with this; but duodenal ulcer was common not only in the American Negro but in natives of Nigeria and of South India. He thought that the factor of social cohesion merited attention; this had been shown to be significant in the epidemiology of suicide and schizophrenia. In this way the social scientist could hope to throw light on stress disorder.

STRESS IN INDUSTRY

Dr. J. J. O'DWYER felt that industry and work conditions were often blamed for stress caused by family or social maladjustments. The social contacts in industry were important, and promotion often caused stress because it made even a charge-hand feel somewhat isolated. In managerial staff it might involve the individual and his family being uprooted to move to where the higher job was. The industrial medical officer and the general practitioner each knew too little of the other's view of the worker-patient.

THE UNIVERSITY STUDENT

Dr. MALLESON said that about 70% of the students of University College, London, consulted the physicians of the student health service during their three-year course of studies. They usually came with some physical symptom, mostly as a face-saving excuse for seeing the doctor for troubles which they themselves attributed to " nerves". The stress affecting the average student fell into two main categories: adolescence (sex problems, leaving home, self-management, " growing-up ", &c.), and studying for a degree. Figures for 1950 and 1951 showed that the more severely neurotic student failed his examinations about twice as commonly as the average, but the slightly neurotic had a lower-than-average rate of failure. For the student, as for civilised man, it might be a choice between stress and stagnation.

The Person in his Family Setting

THE FAMILY DOCTOR

Dr. H. N. LEVITT said that, as a general practitioner, he would agree with Dr. Stephen Taylor's estimate that at least a third of general-practice cases were psychiatric. The bulk of dyspepsia he himself saw was non-organic. The family doctor could often see the effects of the pressure of family, home, neighbours, work, and community, like concentric rings in a magnetic field, surrounding and influencing the patient. Sometimes, to break the circuit, removal of the patient to hospital or nursing-home was essential.

PERSONALITY DEVELOPMENT

Dr. JOSEPH SANDLER described the case of a married woman, aged 35, treated by psychoanalysis for vaginismus and phobic symptoms. It had become clear in the analysis that the patient had unconsciously sought a stressful condition as a means of gratifying masochistic needs and of averting worse evils.

STRESS IN CHILDHOOD

Dr. JAMES ANTHONY said that in considering stress disorders in children it was difficult to distinguish correlation from causality. In one series of 100 children with bowel-training difficulties there was found to be strong correlation between the type of training and later behaviour. Strictness and insistence on early sphincter control by the mother was found to result in the child's encopresis or strong aversion to fæces, and undue laxity in training to be connected with soiling. Sleep disorders were also associated with stress. The child with eidetic imagery was more likely to have nightmares, while the child of haptic, kinæsthetic make-up reacted by sleep-walking.

Special Articles

THE NEW LIVERPOOL MEDICAL SCHOOL

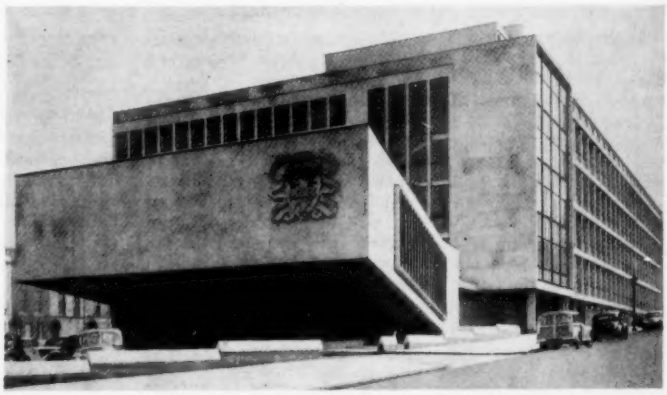
THE growth of all departments and the creation of new ones has meant that the medical school at Liverpool (like many others) has been spread around the precincts of university and hospital—in a converted house, a former nurses' home, and part of the city laboratories. At last many departments—of pathology, bacteriology, medicine, pharmacology, and obstetrics and gynæcology, with the subdepartment of radiodiagnosis—have been gathered into a new building in Ashton Street.

The department of medicine has well-equipped laboratories (provided through the generosity of the family of the late Sir Montague Burton) where electroencephalography and hereditary factors in disease are among the subjects investigated. In the department of pharmacology and general therapeutics the studies include the action of drugs on the nervous system, myasthenia gravis, and the thymus. In the department of pathology, formerly housed in the Thompson-Yates Laboratories opened by Lord Lister sixty years ago, work is in progress on endocrine aspects of cancer, and in the department of obstetrics and gynæcology cancer in women, toxæmia, and sterility are being studied. The work in the department of bacteriology includes investigations on the viruses of smallpox and poliomyelitis and on tissue cultures. Each department is housed on one floor, except that the department of pathology occupies most of two floors.

Besides these departments the new building contains three lecture theatres and class laboratories for the 506 undergraduate and 177 postgraduate students, as well as the dean's offices, a staff common-room, and a committee-room.

Designed by Mr. A. G. Bullen, F.R.I.B.A., the building has a flexible plan, for the floor-space on each storey is unbroken; rooms of any size can be made by internal partitions based on mullions at five-foot intervals along the perimeter. The frame is of reinforced concrete, with prestressed concrete

beams. The facing is also of concrete, except for Portland stone on the Pembroke Place elevation (illustrated here), where the principal lecture theatre projects from the main building in a striking manner. The whole building is centrally heated and air-conditioned, with provision for removing noxious gases (e.g., formaldehyde) and preventing the spread of infection. It is hoped to link the present building with a further block fronting Elizabeth Street: the completed medical school will then house all departments of the faculty.



The new building was officially opened on Wednesday, May 7, by H.M. Queen Elizabeth the Queen Mother, after an address by Lord Cohen of Birkenhead, professor of medicine in the university, who sketched the development of the Liverpool School of Medicine from its foundation in 1834. He said that the pride of a school "lies not simply in the beauty and dignity of its architecture, but in the contribution which those who labour within its walls make to 'the advancement of learning and the ennoblement of life'". He referred to the work of three great Liverpool contemporaries—Sir Ronald Ross, Sir Robert Jones, and Sir Charles Sherrington, all born a hundred years ago.

Later, at a congregation in the Philharmonic Hall, the honorary degree of LL.D. was conferred on Her Majesty, and on Lord Adrian, Sir David Campbell, Sir Allen Daley, and Sir John Hobhouse. Speaking on their behalf, Her Majesty paid tribute to the part Liverpool had played in advancing medicine; in Liverpool, she said, "visitors are conscious of a pulse like a hammer and a vigour which nothing can daunt".

Parliament

An Institute of Criminology

ON the adjournment on May 7 Mr. MONTGOMERY HYDE pointed out that, unlike other European countries and the United States, we had in this country no institute of criminology though it was generally agreed that crime and its methods of prevention and treatment deserved careful and detailed study. No university in the United Kingdom had a chair of criminology, though Cambridge had a department of criminal science with a director at its head. Otherwise the university teaching of criminology in this country usually formed part of the syllabus for the study of sociology, psychology, or other social sciences. At present, readerships in criminology existed only in Oxford and London, the latter tenable at the London School of Economics and Political Science. Some of the provincial universities provided courses in the subject or some branch of it, but teaching was mostly confined to a few odd lectures, though at the Queen's University, Belfast, special attention was paid in the department of psychology to juvenile delinquency. No degrees or diplomas in criminology were available here. A British institute of criminology could coordinate the teaching and research. If it were to concentrate at first on postgraduate work, its activities might stimulate the teaching of criminology to a graduate level in the universities. Then, if it set the high standards which were to be expected, a qualification in criminology might well become desirable or even obligatory for those concerned with the administration of justice. Later non-diploma courses conducted by the institute for justices, police, probation, and prison officers could prove of value, not least as a common meeting ground for discussion.

Sir GEORGE BENSON paid tribute to the work of the new Home Office research section. But its research was intensive and practical, and it was no substitute for an institute which would be a general educational force in the community. We allowed our courts, our magistrates, and the whole administration of the penal system of the country to rest on pure guesswork and tradition. Nowhere at present could the court and the penal machine look for guidance and information. An institute of criminology was a vital need.

Mr. DAVID RENTON, the joint Under-Secretary of State for the Home Department, said that the Home Secretary had been giving much attention to the suggestion made to him by the Howard League that the time had come to encourage the establishment of an institute of criminology in this country. He was convinced that the vigorous pursuit of research into the causes of crime and the treatment of offenders was urgent especially at a time when crime was increasing and none could say what were the fundamental causes of that increase. Mr. Renton himself thought that such an institute would have two ends—to train, preferably at postgraduate level, those who would carry out research and teach others in future, and to provide teaching facilities for those who were concerned in their daily work or in voluntary service with the prevention of crime, the administration of justice, or the treatment of offenders—for example, magistrates, probation officers, members of the police force and of the prison service. In addition, such teaching might help to form a better-instructed public opinion.

Much had been done in recent years to increase research and develop teaching in this field, and the Home Office had done its best to give such help and encouragement as its resources would allow. Research was being planned or was being carried out on the nature of group relations in prisons; the changes brought about as a result of the "Norwich" experiment; the sentencing practice of the courts; the social consequences to offenders of being convicted and sentenced; crimes of violence in the Metropolis; and the development of prediction studies. He agreed that Great Britain was today almost alone in having no institute for the study and teaching of criminology, no chair in criminology at any university, and no separate university qualification in this subject. It might well be that a stage had been reached where the establishment of such an institute within one of our universities would be of great value, in order to give a new impulse to studies in this field, to set high standards in a subject whose academic status had not yet been fully recognised, and also to meet a growing demand for teaching in this subject. The Home Secretary accepted that view and he had undertaken informal consultations with university authorities. Those consultations were still in progress, and were necessarily still confidential, but he hoped that they would lead to useful results.

Professional Income-tax Allowances

IN moving the second reading of the Finance Bill on May 12 Mr. J. E. S. SIMON, financial secretary to the Treasury, said that clause 14 embodied a proposal which would receive much support. Relief would be allowed for annual subscriptions to professional and learned societies with activities related to the employee's work. Subscriptions to Associations such as the medical defence Associations and the statutory registration fees, set out in the fifth schedule, paid by such people as architects and dentists as a condition of being allowed to practise, would also be allowed. The Commissioners of Inland Revenue would approve societies for the purpose of allowance of subscriptions by reference to the criteria which were laid down in the body of the clause, and subject, of course, to the usual rights of appeal. The general test would be whether a society's activities were wholly or mainly of a professional or learned character. Where such a body also had significant activities of a different kind, such as the prosecution of salary claims, the clause provided for the deduction of a fairly apportioned part of the subscription.

Mr. ERIC FLETCHER here asked whether it was intended to deal with subscriptions paid to learned societies by way of covenant? Until recently these had the advantage of enabling learned societies to recover the tax paid. A recent decision in the Court of Appeal had brought about a different result. Was clause 14 intended to restore the position in that respect? Mr. SIMON replied that clause 14 did not deal specifically with that matter, although, where the institution otherwise qualified, money paid under the covenant would rank as a deduction.

QUESTION TIME

Poliomyelitis Vaccine

Mrs. BARBARA CASTLE asked the Minister of Health what target he had set for the production of anti-poliomyelitis vaccine by Messrs. Glaxo and Burroughs Wellcome, respectively.—Mr. DEREK WALKER-SMITH replied: It continues to be the Government's intention that, as soon as supplies are sufficient, only the British type of vaccine should be used in the vaccination scheme. The manufacturers are aware of this, and the issue of individual invitations to produce vaccine does not arise. Nor is there any question of the Government setting a production target for individual firms.

Mr. CLEDWYN HUGHES: Is the Minister aware that in many cases the British vaccine is being given for the first vaccination and a foreign vaccine for the second? Would he say whether that is approved by his Ministry's experts?—Mr. WALKER-SMITH: It is quite all right, on medical grounds, to vary the type of vaccine between the two injections.

Mr. RICHARD FORT asked the Minister when the substantial new supplies of Salk vaccine would become available for use in this country.—Mr. WALKER-SMITH replied: 2 million doses of Salk vaccine which have passed their tests and been licensed for issue in America are due to arrive on May 13, and they will be distributed immediately to local health authorities. Another $1\frac{1}{2}$ million doses of this vaccine are expected next week. In addition, a batch of $\frac{1}{2}$ million doses of British-tested Salk vaccine is now being distributed, and further supplies are expected as tests are completed.

London Teaching Hospitals

Mr. MARCUS LIPTON asked the Minister what plans he was now considering to reduce or change the number of London teaching hospitals.—Mr. WALKER-SMITH replied: None, Sir.

Mr. LIPTON: Has the Minister seen the reports stating that he is considering closing three London hospitals—Charing Cross, St. George's, and Westminster? Is there any truth at all in those reports?—Mr. WALKER-SMITH: I did see a report in a usually well-informed newspaper, but, in fact, I am not considering that course. There are certain proposals in mind with reference to Charing Cross and the Royal Free Hospital, but there is no question of amalgamation.

In England Now

A Running Commentary by Peripatetic Correspondents

REACTIONS to the bus strike make an interesting medico-social study. Observations outside a large South London hospital showed that over the first four days the passenger/car ratio increased from 1·7 to 3·2, a difference held to be significant at the 1% level and the increase appearing to be linear against the log time. Unless the curve starts to flatten out there will be people sitting on the roof. At busy times the cars queue up at bus stops waiting to offer lifts. Further effects are less easy to measure directly, but one may readily conjecture a few: the increasing networks of little friendships for a start: " Oh do you always come this way, that *would* be kind ", then " Tomorrow morning as usual then ", and finally " Do bring the family round this Sunday ". The increase of togetherness and raising of morale, not to mention chance romantic encounters, cannot but have a good effect on the mental welfare of the community as a whole, and hospital admissions should soon reflect this if Messrs. Macleod and Cousins can be persuaded to remain adamant.

Apart from the weather, we haven't had a direct stirring challenge for a long time and it will do us good. My wife's evening class, for example, was on the first night of the strike and is never very well attended. I said surely no-one would turn up, so she might as well get on with the supper; but it didn't work. I had to drive her there and there was the biggest turnout of the year. Motivational research should get going here: did the class overcompensate to the difficulty as one man, or rather one woman? Or were they bored after a long day at home? Or was there some contaminating factor? A fruitful field awaits the enterprising worker: these situations must be exploited by those pursuing PH.D.S.

The effect on the busmen may be less happy, though in course of time the differential between drivers and conductors of peptic ulcer and coronary thrombosis (Morris 195-something) should iron out. A survey of how strikers spend their time would be worth while. Do conductors wander nostalgically up and down stairs? A number of them, of course, have their duties to attend, and face the same difficulties of getting to work as the rest of us. A friend of mine offered a lift to a stranded bloke yesterday and only at the end of 15 miles did he discover his passenger was a strike picket going to his station.

There are other smaller groups to be considered of course. A friend in the bicycle and scooter trade is in danger of passing into an acute hypomanic state: give the strike another fortnight, he says, and he will retire. Trade-union officials, one fears, may be liable to anxiety attacks, and then of course there's the Government. Apart from fluctuations in blood-pressure we would rather not commit ourselves on this delicate subject: perhaps a medical M.P. could be persuaded to fill this gap in our scientific knowledge.

* * *

It has been a good lambing time and the countryside is full of the attractive youngsters, playful, thoughtless, and impulsive, just like our own children. I met three ewes and their lambs yesterday as I entered the enclosed road when coming off the fell from seeing Charlie's children. The ewe on the offside had her lamb with her, so I steered quietly between the mothers; but one of the lambs on the nearside evidently belonged to her, and at the very last moment he dashed across the road and disappeared from my view behind my nearside wing. Sixpennyworth of rubber left my tyres in a cloud of smoke, and I didn't feel a wheel go over him, nor did I feel him hit me; but I got out with a very empty epigastrium, and there, in the road behind, he lay, very still and with his nose bleeding. I carried him to the roadside, and after ten minutes or so he was holding up his head, looking for his mother and seeming much better. So I left him and went back to lunch, intending to go up and see if he was all right after afternoon surgery.

Charlie came down for the children's medicine before I left, so I asked him if he had seen the lamb. "Yes," he said, he had seen it. It had a dirty nose and he thought it had had an accident, but it was with its mother and quite all right, and I was not to worry about it. My wife heard this bit of conversation, and after he had gone she gave me one of those quizzical motherly smiles that she keeps for me when she finds out something that I hope she won't notice. "So that was what was the matter at lunchtime," she said. "You hardly ate a thing and didn't say a word. If a lamb does that to you I hope to goodness you never run over a child." Remembering the empty epigastrium as I got out of the car, I hope to goodness I never do.

* * *

I know a hospital where the Royal Arms, in all their splendour of gilt and scarlet, are floodlit above the portico and where an alcove in the entrance hall is occupied by a portrait of a beautiful Queen Consort. The corridors are decorated in contemporary colour schemes and adorned with boxes of growing flowers and tanks of tiny coloured fish. The wards are divided into four-bed and two-bed cubicles, also in contrasting colours, and with sound-proof ceilings, and the ward kitchens are equipped with stainless steel sinks and cupboards. The surgeon's clients are anæsthetised to the sound of music under a painted ceiling. Can this be the National Health Service? Of course not. It is a well-known military hospital not far from Lambeth Bridge.

* * *

The ordering system in our department is complex, with numerous highly coloured forms to be signed in triplicate. Just recently it became our duty to sign them, and we were fascinated to find what the department had been running on all these years. We even got round to making tentative little inquiries of our formidable senior technician when we found him in a good mood. "What," we would ask timidly, "do we *do* with all these assorted grummets?"

After a time we became a little bolder and actually attempted to strike out one or two items, but it made no difference; they always came back on the next order form, and we were given to understand that interference of this sort made the department almost impossible to run. Eventually we became almost anæsthetic, and nowadays we sign our name without a moment's thought to "36 only alum. pudd. steamers, complete with lid".

But the other day our eye was caught by an item reading:

"1 only tin tray with picture .. .. 4*s*. 0*d*."

We no longer dare to approach our senior technician on matters of this kind, but we sent at once for our new secretary, who is always glad to enlighten us. It seems that the Professor's tea tray had become a Disgrace, that a tin tray with a picture on it is cheaper than a tin tray without one, and that the picture would almost certainly prove to be a spaniel, the trade considering spaniels to have maximum sales appeal.

Convinced by these telling arguments, we signed without demur, and it was not until the matter came up at the afternoon tea club yesterday that we remembered that the Professor is greatly attached to his fox-terrier. A rough canvass of departmental opinion only too clearly supported our fear that the appearance of a spaniel might be regarded as a studied insult. It was widely felt that we had been too precipitate, and should have specified a psychologically neutral picture. We were forced to speak sharply to one of our demonstrators, and our senior lecturer, who owns a Siamese cat, referred slightingly to dogs in general. At this a visiting dog-lover from biochemistry swallowed a cigarette in his agitation, and had to be revived with copious draughts of hot water. The meeting broke up in a general huff, and our migraine came on worse than ever.

It was therefore with some relief that we welcomed this morning an end to the suspense in the shape of the arrival of the tray itself. "We have pleasure," said the accompanying letter suavely, "in supplying to your specification 1 only tin tray with picture, price 4*s*. 0*d*., and trust that it will meet your requirements adequately."

With trembling fingers we undid the string. It was, of course, *The Boyhood of Raleigh*.

Letters to the Editor

TOXOID OR A.T.S.?

SIR,—It is perhaps not generally realised that considerable sections of the civil population have received and are receiving active immunisation against tetanus. These sections include: (*a*) those young men who have completed their National Service; (*b*) the increasing number of young children who are immunised with triple antigen; and (*c*) an appreciable number of older children from independent schools where routine active immunisation is practised.

In the event of injury these individuals should be given a booster dose of tetanus toxoid. It is unnecessary and indeed undesirable to run the risk of sensitising them to horse serum by administering A.T.S. Members of my Association do their best to instruct actively immunised individuals that they should ask for toxoid in place of A.T.S. if they are the victims of an accident. Nevertheless it has been found that this request is all too frequently disregarded particularly in busy casualty departments and A.T.S. is given willy-nilly.

I have been instructed by my Council to bring this point to the attention of the profession through your columns. We would wish that all individuals who are actively immunised should be clearly instructed that they have received *toxoid* and are to ask for this to be repeated if they sustain an injury. On the other hand, we invite casualty officers and others to bear in mind the increasing possibility that the patient has been actively immunised, to ask in every case of injury if this is so and if the answer is in the affirmative to administer toxoid rather than A.T.S.

THOMAS L. SCOTT
Honorary Secretary,
Medical Officers of Schools Association.

Horsham,
Sussex.

SYMPTOMS AFTER CHOLECYSTECTOMY

SIR,—As a physician seeing many patients with gallstones, one must agree with Mr. Burnett and Mr. Shields (May 3) that the use of the term "postcholecystectomy syndrome" is not justified. At the same time general physicians themselves see many patients who have had a diseased gallbladder removed without losing many of their symptoms. In point of fact the results of this operation are not conspicuously good as far as my general experience goes. Despite this it is certainly very proper to recommend removal of gallstones in nearly every case, but the reason for such advice must rest on certain general principles which are not covered by Mr. Burnett and Mr. Shields. The benefits to the patients are long-term not immediate.

Gallstones and diseased gallbladders must be removed for three reasons: (*a*) to prevent further gallstone colic; (*b*) to forestall a nasty attack of acute cholecystitis; and (*c*) to prevent the remote danger of carcinoma of the gallbladder. In these three respects I often feel that the operation is done as much for the benefit of the patient's doctor as for the patients themselves. It is as well to point this out to the patient preoperatively so that they are not misled into thinking that passage through the surgical ward and loss of the gallbladder is going to restore them to complete mental and physical health.

Exactly what symptoms a diseased gallbladder gives rise to is a matter which very few people can accurately define. But when one remembers that in most instances the organ which is removed is not functioning and has failed to function for many years, it becomes quite clear that its simple removal

cannot restore function, so the symptoms must continue. Gallbladder function is not essential to digestion, but its absence will often be felt after greasy meals.

This no doubt is the answer to the problem of the many patients who continue to complain after operation. Even though the common bile-duct does distend it cannot take over the concentrating function of the gallbladder or produce a cistern-like flush of concentrated bile at the psychological point in digestion. Whether this lack of concentrated bile does in fact give rise to symptoms of diseased gallbladder must be a matter for discussion, but it is certainly present both before and after operation and operation itself does nothing to alter this fact.

But beyond this is the very frequent problem of whether what the patient complains of is indeed due to a diseased gallbladder. Mr. Burnett and Mr. Shields have indeed pointed out that it is not unusual to find that postcholecystectomy symptoms have in fact been due to duodenal ulcer or some other intra-abdominal disease. But more commonly the symptoms are due to a small hiatus hernia which has not been diagnosed or to simple reflux œsophagitis which has also not been suspected. Because of these two conditions, it is my general practice to slim the patients before sending them to have their gallbladder removed, provided of course the patient is not suffering from repeated attacks of gallstone colic. This simple process so often removes symptoms previously regarded as due to the gallbladder that unfortunately the patients are often reluctant to have their gallbladders removed.

One further explanation of the poor result of cholecystectomy remains—namely, in most cases the sufferers are obese women in late middle life who are often suffering from hypertension, coronary disease, bronchitis, or some other organic disability which continues to give trouble after operation. If the organic side is not at fault in these patients, they are emotionally battered and beset by large families, small incomes, and much work. They would in any case give rather poor results after any form of surgery.

We are at the moment going through a changing pattern in regard to cholecystitis which may make for better results in the future. A diagnosis is now being made after the first or second pregnancy and gallstones or gallbladders are being removed in younger women with much better long-term results. Operation at an earlier stage in gallbladder disease would therefore give better results and should be our aim. But in summary the relatively poor symptomatic result after operation here is due to the fact that most of the symptoms complained of subsequently were really present before the operation was undertaken and could not be expected to be helped by surgery in any case.

Liverpool. ROBERT KEMP.

SIR,—I should like to comment on the article by Mr. Burnett and Dr. Shields.

In the summary and in the text they say that they found no evidence of biliary dyskinesia. If their case-summaries are complete, I submit that the surgeons who operated on these patients did not look for a dyskinesia. The only methods of diagnosing biliary dyskinesia accurately are serial cholecystography,[1] one of the methods of manometry,[2] and chronovolumetric estimation of bile,[3] which can be misleading. One can, however, suspect a dyskinesia from the clinical history.

All the cases quoted in table II, with the possible exception of cases 13 and 20, could well have a dyskinesia. On the necessarily meagre details given in the tables I postulate that cases 7, 8, and 17, in addition to their vesical calculi, had a biliary vesicular stasis, probably due to a biliary hypotonia, which was neither diagnosed nor treated at the first operation. The biliary hypotonia was the primary and more important abnormality and the stones the secondary. The primary abnormality remained and so did the symptoms. Case 10 almost certainly has a hypotonic dyskinesia. The patients with duodenal ulcers may have had a hypertonic dyskinesia secondary to the ulcers at the first operation and may have it still.

Mr. Burnett and Dr. Shields say, " We had intended to study patients with ' biliary dyskinesia ', but we were unable to find one. We conclude that this condition does not arise where cholecystectomy is done for such reasons as in this series ". This conclusion, I humbly beg to suggest, is totally unwarranted if the authors took no steps to discover the presence or absence of dyskinesia, and they do not say that they took such steps as are necessary to make this diagnosis. The information they give leads me to believe that had the necessary steps been taken a dyskinesia would have been demonstrated in the majority of their cases.

Newcastle upon Tyne. J. DUDFIELD ROSE.

1. Rose, J. D. *Brit. med. J.* 1958, *i*, 360.
2. Mallet-Guy, P., Rose, J. D. *Brit. J. Surg.* 1956, **44**, 55.
3. Varela Lopez, J., Varela Fuentes, B., Martinez Prado, G. *Arch. Mal. app. digest.* 1950, **39**, 797.

USE AND TOXICITY OF SULPHONAMIDES

SIR,—In his letter of April 26, Dr. Laurance asked for suggestions from the manufacturers as to a method for ending the confusion caused by the similarity of the names of ' Sulphamezathine ' and sulphamerazine. This is a situation which has also been causing us some concern, and with the idea of effecting an improvement we recently registered the alternative trade mark ' S-mez ' for ' Sulphamezathine '. Already we find it welcomed by doctors as distinctive and easier to write. Further, and in line with Dr. Laurance's final point, we have taken steps to ensure that the official *B.P.* name, sulphadimidine, is given prominence on all labels and literature for ' Sulphamezathine ' and its preparations.

Imperial Chemical Industries, Ltd.,
Pharmaceuticals Division,
Wilmslow, Cheshire. B. C. BRYANT.

SEPARATION OF MOTHER AND CHILD

SIR,—In their letters commenting on mine of March 1, Dr. Kräupl Taylor (March 22) and Dr. Howells (March 29) raise rather different points. Dr. Taylor draws attention to certain shortcomings in a recent publication [1] and asks for further particulars: these I shall try to provide on my return to England.

Our discarding of certain data as unreliable was done on the basis of defined criteria and only when two independent judges were in agreement that one of the criteria had been met (see p. 222). In our view it is the quality of the data rather than our handling of them which is most open to criticism. My theoretical and practical conclusions naturally rest on a broader basis than these data alone.

At many points Dr. Howells and I are in agreement. The distinction between separation and deprivation is discussed in the opening paragraphs of *Maternal Care and Mental Health*, while much of the second part is concerned with how best to care for children out of their own homes so as to avoid their suffering privation. Further, we agree that much mental ill health in children arises from privation suffered by them while living in their own homes. Where we seem to differ is in the weight we give to the emotional attachment that commonly exists between a child and his mother (and the rest of the family) and the anxiety and grief which result from the rupture of such relations. He seems to suggest that separation without privation is of no consequence. Admittedly, as Dr. Howells' own work confirms, stays with relatives and friends whom the child already knows and trusts need have no ill effects. The

1. Bowlby, J., et al. *Brit. J. med. Psych.* 1956, **29**, 211.

acute distress and anxiety which young children experience when placed with strangers, no matter how kind, is well attested however (e.g., Heinicke [2]), while the records of children who have been moved from one good foster mother to another show that cumulatively such experiences can have very adverse results.

It is because the removal of a young child from his home to the care of strangers is usually productive of intense anxiety, misery, and anger (often even when the home he leaves is a bad one), and also because it all too frequently leads to further moves, that I believe it should be undertaken with great circumspection. Efforts to improve the home, though requiring time, skill, and patience, are in many cases preferable in the long run.

As from Tavistock Clinic, London. JOHN BOWLBY.

IODINE PROPHYLAXIS OF GOITRE

SIR,—In a leading article in your issue of April 12, you advocated the addition of some form of iodine to all the table or kitchen salt sold in the United Kingdom, except that which might be demanded free from such addition. "The United States, Switzerland, and New Zealand have been using prophylactic iodine for several decades, and goitre has notably declined in all three countries." May I point out that the iodinisation of salt is not required in the United States and that its general use there, or elsewhere, is scarcely a matter of "several decades" but of only two or three.

Of greater significance is the fact that goitre has been diminishing in prevalence and intensity in Switzerland for more than fifty years before iodised salt was introduced into *any* canton.

In opening the First International Goitre Conference, the president stated "les goîtres énormes, difformes, qui frappaient autrefois l'observateur à première vue ont presque disparu".[3] He also called attention to the change in the proportion of recruits rejected from military service because of goitre: from 10% in 1885 to 2·97% in 1912 and 1·3% in 1924–5. The figures later collected by Schaub [4] showed that the decrease was greater between 1905 and 1910 than in any similar period after the introduction of iodised salt.

Similar changes have been reported from England [5 6] and many other places from Rumania to the United States, West Africa, and South America.[7–15] In at least one instance, the disorder returned after an absence of about fifty years, to be regarded as a new disease.[16]

In 1927, Cornwall and the Isle of Wight were among the districts in which were found the highest proportion of enlarged thyroids among schoolchildren. Can it be seriously contended that their diets were more likely to be deficient in iodine than were those of the children of Bedford and Hertford with less than half the proportion of goitres or of Cambridge and Huntingdon with less than a tenth? [17]

The use of iodised salt is not without its possible dangers. Many have not observed any ill effects but others have. The literature abounds in instances, but I shall quote only from *advocates* of the use of iodised salt.

In New Zealand, the number of patients admitted to public hospitals because of exophthalmic goitre during the five years following the introduction of salt containing 1 part of potassium iodide per 20,000, after a longer period with a lower concentration, increased by 7% although the number of those admitted because of other thyroid diseases fell.[18]

In Lausanne, the proportion of adenomas of the thyroid encountered in *all* the necropsies increased from 1936–37 to 1946, in all except the lower age-groups, whether the comparison was between either or both sexes at the same age or between groups dying in 1936–37 with similar groups ten years older in 1946.[19] Marine [20] recognised that the introduction of iodised salt had been followed by an increase in the number of cases of hyperthyroidism. He regarded this as a temporary phase, to disappear as the number of new goitres falls. Perhaps his faith will be justified, but there is no good evidence that this will be the case or, if it should occur, that the use of iodised salt should be considered responsible.

It may well be that the change from simple goitre to hyperthyroidism is not due to iodised salt but to unknown factors. However, if one may argue *Post hoc, ergo propter hoc* to show that iodised salt has diminished the number of simple goitres, one may suggest that the same may hold for the increase in hyperthryroidism.

Would it not be well to make another survey to find out if there has not been in England a great diminution in the prevalence of simple goitre since 1927? Or shall the United Kingdom join other nations in emptying the ocean with a pail when the tide is running out.

New York University College of Medicine. ISIDOR GREENWALD.

REGIONAL DISTRIBUTION OF CONSULTANTS

SIR,—The figures for consultants, beds, and population for each regional hospital board (given in your issue of April 26, p. 907) make interesting reading. I calculated the number of beds and population per consultant and also the number of hospital beds per 1000 population in each region as follows (I have omitted the two smallest regions).

Region	*Beds per consultant*	*Population per consultant*	*Beds per 1000 population*
Newcastle	46	8867	5·2
Leeds	76	13,215	5·7
Sheffield	70	14,842	4·6
N.W. Metropolitan ..	42	9386	4·5
N.E. Metropolitan ..	60	9789	6·1
S.E. Metropolitan ..	56	9096	6·1
S.W. Metropolitan ..	50	9328	5·3
South Western ..	64	10,780	5·9
Welsh	68	11,102	5·9
Birmingham	57	11,390	5·0
Manchester	73	13,563	5·4
Liverpool	72	10,862	6·6

The variation is quite staggering, and if the consultant cover for the whole country were brought up to that of the best-staffed regions, I estimate about 1600 new consultants would be needed.

Such "backward" areas as Leeds, Sheffield, Manchester, and Liverpool, in particular, need strong reinforcements, and Sheffield in addition is obviously short of beds. It would be interesting to know the number of S.H.M.O.s in each region; and if these are known, perhaps you, Sir, would publish them. It may well be that the regions poor in consultant cover are using an excess of S.H.M.O.s and, if so, this fact should be considered by the committee reviewing those S.H.M.O.s who claim to be doing consultant work. I rather suspect, however, that

2. Heinicke, C. M. *Hum. Rel.* 1956, **9**, 105.
3. Carrière, H. Comptes-rendus de la conférence internationale du goître. Berne, 1927; p. xix.
4. Schaub, F. A. Ueber Erfolge der Kropfprophylaxe. Dissertation, Zurich, 1949.
5. Webb, W. *Brit. med. J.* 1886, i, 686.
6. Turton, P. *Lancet*, 1927, ii, 1170.
7. Hirsch, A. Handbook of Geographical and Historical Pathology; vol. 2, London, 1885.
8. Osler, W. *Amer. med. Sci.* 1893, **106**, 506.
9. Republica Argentina. Second and Third Census, 1895, 1914.
10. Câmpeanu, L. Problema gusea cretinizmului in Romania. Cluj, 1924. French résumé, p. 162.
11. Bérard, L., Dunet, C. Comptes-rendus de la conférence internationale du goître; pp. 276–302. Berne, 1927.
12. Fiamberti, A. M. *Rasc. Stud. psichiat.* 1934, **23**, 866.
13. Ortz de Landazuri, F., et al. *Riv. Clin. espanol.* 1948, **38**, 304.
14. Greenwald, I. *J. clin. Endocrin.* 1950, **10**, 1309.
15. Kreuger, E., Armattoe, R. E. G. *Med. World*, 1951, **74**, 70.
16. Greenwald, I. *Bull. Hist. Med.* 1945, **17**, 229.
17. Campbell, J. M. H. *J. Hyg. Camb.* 1927, **26**, 1.
18. Hercus, C. *Canad. med. Ass. J.* 1953, **68**, 531.
19. Ryncki, P. Contribution à l'étude de l'endémie goîtreuse, Canton de Vaud. Thesis, Lausanne, 1952.
20. Marine, D. *Ann. intern. Med.* 1953, **41**, 875.

the areas with low consultant cover will also be low in numbers of S.H.M.O.s.

But in any case, if the backward areas were only brought half-way towards the best-staffed areas, the S.H.M.O. and senior-registrar problem would be solved.

As I have an axe to grind, may I sign myself

S.H.M.O. (EX-SENIOR-REGISTRAR).

SPERMATOGENIC REPOPULATION OF MOUSE TESTIS AFTER X-IRRADIATION

SIR,—A single 1000r exposure of male C57 black mice shielded above the pelvis resulted in the usual depopulation of the spermatogenic tubules.

Three weeks after exposure tubules appear essentially empty except for certain cells lining the basement membrane. These have been called Sertoli elements by many observers. Closer seriation of the preceding events reveals the following:

Acute exposure to 1000r leads to death of all spermatogonia. Spermatocytes continue to develop until they meet a block at or near first meiotic anaphase. This block has been found to persist in the present material for at least ten days. The division block leads to a restitution M1 (first meiotic metaphase) division. The resulting diploid cell appears viable. Groups of such cells gradually move to the basement membrane, where they take up positions beside the surviving Sertoli nuclei. These restituted cells can thoroughly mimic the appearance of Sertoli units. With time, and in certain tubular-cross sections, these "restituted M1 survivors" divide mitotically and give rise to a new spermatogonial layer, from which the complete cycle of spermatogenesis is gradually rebuilt.

A detailed account involving autoradiography and electron microscopy is being prepared.

Division of Biological and Medical Research, Argonne National Laboratory, Lemont, Illinois, U.S.A.

B. R. NEBEL
D. H. DLESK.

ADRENALINE CREAM

SIR,—Dr. Moss (March 29) will be pleased to hear that not all the clinical trials of adrenaline cream have been so perfunctory as he suggests.

In a strictly controlled "double-blind" investigation recently conducted at this and other hospitals, the analgesic effect of adrenaline cream was compared with that of two rubefacient ointments and an inert substance. The two rubefacients selected were nonylic acid vanillylamide combined with the β-butoxyethyl ester of nicotinic acid, and a combination of methyl nicotinate, glycol salicylate, histamine dihydrochloride, and capsicum oleoresin. These are the active principles contained in two well-known and widely used proprietary ointments.

50 patients with degenerative joint disease of the spine were subjected to the trial. They were thoroughly questioned, examined, and assessed at fortnightly periods before, during, and after being told to apply each ointment. They received no other concomitant therapy.

The results of this trial are interesting. In only 9 of the patients treated was there any measurable objective improvement following the use of any one of the ointments, and in 3 of these this followed the use of the inert cream. Subjective assessment showed that 21 patients preferred the ointment containing the nonylic acid vanillylamide, 11 preferred the methyl nicotinate combination, 4 preferred the adrenaline cream, and 4 the inert cream. 10 patients were unable, or unwilling, to express any preference.

Although, in fact, these results do not attain any strict level of statistical significance, certain conclusions may be drawn.

(1) Objective improvement cannot be expected to follow the use of analgesic ointments.

(2) In the conditions treated, the majority of patients experienced greater symptomatic relief from nonylic acid vanillylamide combination. This was, in fact, the more effective in producing skin hyperæmia and the more irritant of the rubefacients tested; its application has been shown by Symons [1] to produce significantly higher skin temperatures than other available preparations.

(3) There appeared to be little difference between adrenaline cream and the inert cream in relieving symptoms. These are obviously the least effective in producing hyperæmia.

One cannot, with our present lack of knowledge of skeleto-muscular physiology, attempt to draw conclusions as to the mode of action of these applications, but the impression is that the efficacy of an ointment in relieving symptoms is directly proportional to its local irritant action. Why this should be so is not immediately obvious, but I feel that it is significant that several patients, when describing the change of symptoms that resulted from the use of the most potent rubefacient, stated that they "felt that it was doing most good"; surely some psychosomatic explanation could be the answer.

Orpington Hospital, Orpington, Kent.

P. HUME KENDALL.

RELEASE BINDINGS ON SKIS

SIR,—Referring to your note on this subject (April 26, p. 917), I most strongly endorse the findings given, having used efficient release bindings covering torsion and forward throw for some five seasons. I have never suffered anything worse than the slightest joint soreness, and neither have my skis become detached in normal skiing. A reasonable mechanical sense to adjust the bindings correctly is necessary.

The design of "safeties" is difficult, especially if ski-mountaineering is undertaken, it being imperative to avoid accidents under high alpine conditions. I have such faith in "safeties" that I do not insure, taking into account the very high premiums.

There is still extreme bias against "safeties" on the Continent among instructors and others, and the novices who need them most use them least, as the figures you quote show. I can see no valid reason whatever against the adoption of properly adjusted "safeties".

Beaconsfield, Bucks.

NICHOLAS DALTON.

VISITING MENTAL HOSPITALS

SIR,—Throughout this country, and indeed the world over, there are people who devote much of their time and some of their money to visiting lonely patients in hospital. Yet such visits, by those who are neither relatives or personal friends, are seldom permitted in our mental hospitals, where the need is greatest. It is in mental hospitals that so many patients live on year after year—their relatives having died or deserted them—receiving no letters, and having no contact with the outside world. Since it requires but little imagination to appreciate their loneliness, it seems to me strange that, whereas a request to visit a general hospital for philanthropic purposes is welcomed, a similar request to visit a mental hospital is likely to be turned down.

Though it may be true that comparatively few would care to penetrate the somewhat bleak and grim realities of everyday mental-hospital life, I am nevertheless certain that a substantial number of good people could be found willing to do so. Some authorities will say that visits by medically untrained persons are fraught with danger. But the risks are largely neutralised by the fact that responsible nurses are always on duty in the wards, and also by imposing the condition that nothing whatever (except tobacco, sweets, books, and writing-paper) may be

1. Symons, H. F. B. *Ann. phys. Med.* 1958, **2**, 174.

taken into the hospitals by such visitors. After all, our visiting chaplains are not medically trained either.

But the advantages of visiting have already been demonstrated in practice as well as in theory. I know of a Scottish mental hospital, for example, where the physician-superintendent has arranged with various local Church guilds to "adopt" the more lonely of his patients, and to give them friendship, and even an interest in life. Here, once every month, a busload of guildswomen arrive at the hospital; there is chatter and laughter in the corridors, there are picnics, days at the seaside, and even days spent in the comfort of their visitor's own home.

All the mentally ill are, at bottom, starving for the want of love, and for outside interest in themselves. Since there are people willing to do what they can to help these patients, surely every mental hospital ought to be encouraging—indeed seeking—such help?

Edzell, Angus. H. G. WOODLEY.

RETICULOHISTIOCYTOSIS

SIR,—In *The Lancet* in 1955,[1] under the heading A Rare Disease with Features Resembling both Rheumatoid Arthritis and a Lipoid Accumulation, I referred to the case of a man which I first described with Dr. W. Freudenthal,[2] under the heading Nodular Non-diabetic Cutaneous Xanthomatosis with Hypercholesterolæmia and Atypical Histological Features. Dr. George Graham gave me frequent opportunities of observing the case of a man under his care with analogous symptoms. This man ultimately died and an elaborate account of his case was published [3] under the heading A Case of Hitherto Undescribed Lipoidosis simulating Rheumatoid Arthritis. I now believe that Graham's case was of exactly the same nature as that of Parkes Weber and Freudenthal, but complicated by the supervention of a sarcomatous growth and a microbic infection, which caused the patient's death. The case of Weber and Freudenthal apparently subsequently recovered with considerable permanent changes in bones and joints.[4] I think that "congenital development diseases" are not so very rarely terminated by the supervention of malignant growth, which complicates the diagnosis.

London, W.1. F. PARKES WEBER.

"THESE DYING DISEASES"

SIR,—Dr. Vickers (March 19) advocates abolition of the venereal-diseases clinic and dispersion of its patients to other hospital departments. This, from a dermatologist, is very strange: syphilis is still the great imitator, and rashes appear to be the least common sign in early or late syphilis. In the Services, venereal diseases and skin diseases were formerly combined, but early in the late war it was found necessary to separate them—particularly on the insistence of the dermatologists.

Under Dr. Vickers' scheme the following questions would arise:

(1) Would a patient be able (as at present in V.D. clinics) to attend without an appointment and without a doctor's letter?

(2) Who would see the transient patient—e.g. the long-distance driver, or seaman, who carries a small travelling book (v.15 and v.44 respectively) in which all treatment given and all pathological reports are recorded. Could the patients be seen immediately and by whom?

(3) Who would undertake the care of the pregnant syphilitic woman, and which department would investigate false positive Wassermann reactions? Who would be responsible for telling a patient, without confirmation, that she has syphilis—knowing the likely effect on the patient and the family, and the risk of legal action against the doctor?

(4) Who would see the cases of Reiter's syndrome—the ophthalmologist, the genitourinary surgeon, or the general physician?

(5) Which department would deal with neurosyphilitics with cardiac complications?

Investigation of the patient's social background, tracing contacts, and dealing with "case holding" until adequate treatment has been given is not the work of the several departments mentioned by Dr. Vickers. Moreover the V.D patient prefers the confidential approach and constant sympathetic staff found in V.D. clinics.

The success of the anti-V.D. scheme in Great Britain has depended largely on the coordination which the venereologist has created from the chaos which existed when so many treated venereal diseases. And, whereas the returns to the Ministry as at present compiled by the venereologist are at least a good indication of the epidemiological situation of venereal diseases, under Dr. Vickers' regime no return would ever be completed.

The Royal Hospital, Sheffield, 1. A. I. MORRISON.

CEREBRAL PALSY

SIR,—Although I hardly dare to quarrel with the definition of cerebral palsy proposed by such an eminent group of "interested people" in their letter of May 3, I do feel that the second explanatory footnote (which reads, "This excludes such quantitative disorders of movement as might be met with in mental defectives") is both misleading and unjust. If we are to have strict definitions about cerebral palsy let us also be clear about mental deficiency.

Other "interested people", like myself, whose work lies with patients suffering from "damage of the brain from intrinsically or extrinsically caused development disorder (occurring in fœtal life or after birth) or perinatal, paranatal or postnatal in origin" (footnote 4), do not call their patients mental defectives or think of them as such. Mental deficiency is a legal term, not a diagnosis.

It is a great disappointment to us that pædiatricians and neurologists continue to perpetuate, along with nearly all the rest of the medical profession, such misunderstanding. They regard all brain damage severe enough to preclude educability as "mental deficiency" and an invidious distinction has grown up between cerebral palsy and mental defectiveness, whereas we know that it is quite possible for a child with cerebral palsy to be deemed, quite correctly, ineducable and, therefore, mentally defective. This child is not suffering from some other disorder superimposed on his cerebral palsy, His "non-progressive brain damage" is merely more severe.

In exactly the same way the child showing quantitative disorders of movement, which excludes him, by the definition, from the "cerebral palsy" group, is suffering from either brain damage which may also fit quite well into footnote 4 of the definition or from some other physical disorder—e.g., metabolic. He is not, however, suffering from mental deficiency

I earnestly hope for the closer integration of "mental deficiency" (sic) with general medicine, and this will not come about as fast as it might so long as the severely damaged child suffering from an obvious, clear-cut physical disorder is suddenly labelled "mentally defective" by the general hospital physician and instant dispatch to an "institution" advised.

Botleys Park Hospital, Chertsey, Surrey. J. M. CRAWFORD.

1. *Lancet*, 1955, ii, 395.
2. *Brit. J. Derm.* 1937, **30**, 522.
3. Graham, G., Stansfield, A. G. *J. Path. Bact.* 1946, **58**, 545.
4. Parkes Weber, F. *in* MacKenna's Modern Trends in Dermatology; p. 309. London, 1948.

TREATMENT OF ASTHMA AND HAYFEVER BY HYPNOSIS

SIR,—The article by Dr. Mason and Dr. Black (April 26) is of considerable interest, but attention must be called to a serious misinterpretation of results at one point.

A series of skin tests with pollen extracts performed at weekly intervals in one small area of the body (the left forearm) could not fail to produce a gradually increasing hyposensitisation of the skin of that area irrespective of whether the patient was receiving hypnotic treatment or not. The random tests on the leg gave the true picture. The statement which they make that suggestion under hypnosis directed against her hayfever and asthma symptoms only, could inhibit *selectively* the allergic or atopic reaction in different parts of the body is therefore based on false premises. In their experiment there is no valid evidence that the skin responses were altered until specific hypnotic suggestion to that effect was made. That this could occur had been clearly shown many years ago by Clarkson [1] and Marcus and Sahlgren.[2]

Further investigation of the effect of hypnosis on the allergic skin reaction would be of great interest and might help to determine the point at which it acts. Might I suggest that a fruitful line of inquiry would be to determine the effect of histamine-induced weals. If a series of histamine dilutions ranging from 1/10,000,000 to 1/10,000 is used as testing material a clear-cut endpoint will be found in the normal individual. Dilutions up to 1/100,000 will usually produce a response, beyond that no reaction can be obtained differing from control saline. This test might be carried out on a patient before and after hypnotic suggestion. Another point which might be of interest would be to determine whether the Prausnitz-Kustner reaction could be abolished in a recipient who had previously received hypnotic suggestion.

Might I suggest that for recording of reactions it would be found less cumbersome if the area of wealing is outlined directly on to the patient's skin with a ball-point pen before the ' Sellotape ' is applied? A perfect transfer can then be obtained and can be kept as a permanent record for photography or other means of measurement.

Liverpool. D. BLAIR MACAULAY.

SIR,—When the course of a chronic illness which has proved resistant to years of conventional treatment is reversed when treated by hypnosis, this seems good evidence to both patient and doctor of the value of hypnosis. Other doctors, however, may remain unconvinced; Dr. Pepys and Dr. Freeman (May 10), for instance.

Hypnosis now needs to be tested by controlled studies conducted by accepted research techniques. The treatment of warts could provide satisfactory material for such a study, for photographs could provide objective evidence of the response to treatment. Hypnotic treatment could be compared with a placebo and with an accepted treatment, such as the application of CO_2 snow. Such a study could add considerably to our knowledge of clinical hypnotism. Much laboratory work is being carried out, but there seems to be little comparable serious clinical research. The B.M.A. subcommittee which reported favourably on the medical use of hypnotism [3] stressed the need for research and suggested five fields that might prove rewarding. They suggested that such research should be organised through university departments and research foundations. I trust that their advice is being acted upon and that this valuable technique of hypnosis can finally lose any stigma of quackery and become accepted as a normal medical procedure.

St. Paul's Cray, Kent. L. M. FRANKLIN.

1. Clarkson, A. K. *Brit. med. J.* 1937, ii, 845.
2. Marcus, H., Sahlgren, E. *Acta psychiat. neurol.* 1936, **11**, 119.
3. *Brit. med. J.* 1955, i, suppl. p. 190.

SIR,—It is nearly one and three-quarter centuries since Lavoisier composed the report of the commission of the Académie des Sciences appointed to inquire into the alleged cures affected by Mesmer, who had come to Paris from Vienna in 1778 and claimed that cures could be effected by animal magnetism or hypnosis. His remarks are so pertinent to present-day reports of clinical trials and claims of the therapeutic benefits of new and old remedies that they are worth quoting in some detail:

"The art of drawing conclusions from experiments and observations consists in evaluating probabilities and in estimating whether they are sufficiently great or numerous enough to constitute proof. This kind of calculation is more complicated and more difficult than it is commonly thought to be; it demands a high degree of sagacity and is for the most part beyond the powers of the generality of mankind. It is on the errors in calculations of this kind that the successes of charlatans, sorcerers and alchemists are based, and so formerly were those of magicians, enchanters and all those in general who deceived themselves or who sought to take advantage of a credulous public. In medicine, especially, the difficulty of evaluating probabilities is greater. As the principle of life in animals is an active force increasingly tending to overcome all obstacles, so Nature, left to her own devices, cures a great many diseases; and when remedies have been applied, it is very difficult to decide how much is due to Nature and how much to the remedy. So, while the multitude considers the cure of the disease to be a proof of the efficacy of the remedy, the only inference in the eyes of the judicious is a degree of probability, more or less great, and this probability can be turned into certainty only by a great number of instances of the same kind."

It should be well known to all practitioners that the vast majority of persons with atopic disorders, such as asthma and eczema, will recover spontaneously sooner or later. Therefore, to discover whether any method of treatment is beneficial in this group of maladies it is essential that a properly designed therapeutic trial be carried out, with adequate controls, and the results subjected to rigorous statistical analysis before they are submitted for publication. It is quite unwarranted of Dr. Mason and Dr. Black to draw any conclusions as to the effect of hypnosis either on asthma or the skin reactions elicited by allergens, before and after hypnosis, in their *solitary* case of asthma in a housewife (April 26).

The fact that therapeutic claims based on a solitary case can still be published reveals a serious defect in the present-day education of the medical student, and it would seem that the time has arrived when we must insist that all medical students receive a course of instruction in elementary statistics and probability theory so that they will understand more about the design of experiments and the statistical controls necessary to evaluate the results of clinical and other trials.

Such instruction should well repay the nation in the shape of a reduced drug bill, and the practitioner himself will have to read fewer uncontrolled trials and unsubstantiated statements of success with new or old methods of treatment.

London, S.E.1. E. J. MOYNAHAN.

*** Dr. Moynahan has perhaps misunderstood the purpose of the report and our reason for publishing it. Since hardly anybody now doubts that symptoms of various kinds can be modified by suggestion, a "therapeutic claim" or recommendation of the method, based on a single case, would certainly have been inappropriate. On the other hand, 180 years after Mesmer reached Paris, nobody yet knows how suggestion works. If it can (as some believe) evoke or abolish physical lesions as well as symptoms, its effects should be demonstrable most conveniently on the skin; and the observations of Dr. Mason and Dr. Black form an interesting complement to

(for example) J. A. Hadfield's apparent success in raising blisters by hypnotic suggestion [1 2] and R. L. Moody's observations [3] of bodily changes during an abreaction under 'Evipan' narcosis. As was pointed out last week, the design of their experiment was such as to allow other interpretations of the results; but flaws of this kind are not unknown in quite large clinical trials conducted under the highest auspices. Single observations can be significant, provided they are correct; and they may have to be made almost by chance if, as Dr. Hadfield found, the results of experiments in one "susceptible" person may not be reproducible in others. Whether or not Dr. Mason and Dr. Black are right in their conclusions, they seem to us to provide at least a novel approach to questions which have gone too long unanswered.—ED. L.

ABSENCE FROM WORK ON A MEDICAL CERTIFICATE

SIR,—We learn from Mr. Woodhouse's letter of May 3 that employers are preferring their employees to write their own "sick notes". This is going to deprive the general practitioner of practically the last aspect of his dying art—the "certification" of illness. With child-welfare clinics looking after his youngest patients, maternity services caring for his mothers-to-be, hospital clinics treating his diabetics, epileptics, and skin cases, and their follow-up clinics taking care of his only "interesting" cases of physical disease, surely he must feel that if he is to practise any medicine at all he must exchange general practice for hospital practice.

Many patients pester him to see a "specialist", and are unsatisfied until they do so: to the average layman a specialist means a hospital doctor. Let not the general practitioner covet the interesting medical life of the hospital doctor, however, for although the public may appreciate his importance, the Ministry take a different view. When speaking of registrars (the backbone surely of the hospital service), Dame Enid Russell-Smith [4] makes the astonishing remark that in the Ministry "we do not feel that the hospital doctor is necessarily ready to be in full charge of patients". I would add that hospital doctors' salaries accord with this attitude.

REGISTRAR (LATELY IN GENERAL PRACTICE).

RECORDING THE HEART-RATE DURING EXERCISE

SIR,—Your Occasional Survey (May 3) draws attention to the difficulty of recording the heart-rate during vigorous exercise. While the electrocardiogram (E.C.G.) is the only suitable signal source, it is impossible to reject unwanted muscle action-potentials by simple filtering without degrading the E.C.G. potentials themselves.

We overcame this difficulty [5] by using a differential amplifier to reject in-phase signals at the input stage, leaving the E.C.G. with only a few random muscle spikes which could easily be filtered off. The T waves were attenuated in the main amplifier and any tendency to count them as well as the R waves was finally eliminated by the trigger sensitivity control rather than by the adjustable "refractory period". We have found it convenient to record heart-rate with ventilation-rate and respiratory frequency on the same strip of paper.

The cardiotachometer works reliably during violent muscular movement (running uphill on a treadmill), at rates up to the maximum so far encountered (200 beats per min.) and in the presence of potential interference from sparking points, relays, and treadmill motor. We feel that it brings closer the "technical finality" mentioned by your contributor than any of the devices he describes.

Physiology Department, W. T. S. AUSTIN.
Department of Therapeutics, Edinburgh University. E. A. HARRIS.

ONE RADIOGRAPH TO EXCLUDE PLACENTA PRÆVIA

SIR,—In most cases of antepartum hæmorrhage the placenta is normally situated. In a recent survey at this hospital of 130 such cases only 23 (17·7%) had placenta prævia. Our aim in our paper (April 19) was to find a simple harmless method which in our hands would obviate the need for a long hospital stay in about 80% of these cases.

In retrospect we found that a single lateral radiograph after the thirty-fourth week showed evidence of a normally situated placenta in 90 out of 107 cases. Subsequent events confirmed that those 90 patients could have been allowed to return home with safety. We would, of course, agree with Dr. Reid (April 26) that a single lateral radiograph will not be infallible in excluding placenta prævia, and also think that it would be unwise to claim 100% success even with full radiological investigation. It is perhaps unnecessary to stress that only the closest correlation between the radiological and clinical findings will avoid mistakes.

We would point out to Mr. Percival and Dr. Murray (April 26) that in this series the overall error was 2·8%, and like these two contributors we have found that the errors have diminished with experience.

J. L. FREER
Leicester General Hospital. D. R. CAIRNS.

SIR,—For over five years I have been carrying out soft-tissue placentography using one film only and I should like to comment on the paper by Dr. Earn and his colleagues in your issue of April 19 and the subsequent letters by Mr. Percival, Dr. Murray, and Dr. Reid (April 26).

It appears to me that when soft-tissue placentography is discussed there is some confusion as to what exactly is meant by the term. To me "soft-tissue placentography" means demonstrating the placenta, and with a suitable technique this can be done irrespective of the fœtal presentation. I have never required the services of an obstetrician in the X-ray department for this type of examination. While displacement of the presenting part is present in placenta prævia this is no guide to the diagnosis; displacement is frequently present without placenta prævia.

I cannot agree with Dr. Earn and his colleagues that in placentography no special skill or equipment are required. With regard to equipment I consider a filter to be essential, otherwise a properly balanced film is unobtainable. Having tried various filters I have found the water pillow to give the most consistent results; being flexible it moulds itself to each patient and sustains the abdomen in the true lateral position. By using a sandbag the quantity of water under the abdomen of a small patient can be adjusted. The radiography must be carried out with the greatest care, a repeat film should be a rare occurrence, and in this hospital all the placentography is done by the radiologists.

So far I have not had Dr. Reid's experience of finding a major degree of placenta prævia with a normal lateral radiograph, but lateral implantation, though fortunately uncommon,

1. Hadfield, J. A. *Lancet*, 1917, ii, 678.
2. *ibid.* 1920, ii, 68.
3. *ibid.* 1946, ii, 934.
4. *Brit. med. J.* May 3, 1958, suppl. p. 222.
5. Austin, W. T. S., Harris, E. A. *Quart. J. exp. Physiol.* 1957, **42**, 126.

is one that might be missed and one has to keep this possibility in mind: such cases are the only ones which would require more than one film.

Full details of the technique and results are to be found in the *Scottish Medical Journal*.[1]

Southern General Hospital, Glasgow. R. McG. C. CRAWFORD.

NEW METHOD OF PHENOBARBITONE ADMINISTRATION

SIR,—I was surprised that Dr. Pearson (April 19), in his comments on Dr. O'Connor's paper (March 22), quotes the work of Butler et al.[2] Butler claims that, in regard to the constancy of blood-levels produced, there is no significant difference between the administration of phenobarbitone in tablet and in 'Spansule' form. I find this claim to be based, however, on most inadequate experimental evidence.

Butler gave tablets of phenobarbitone at six-hourly intervals to 2 patients and measured the resulting blood-phenobarbitone levels at two, five, and nine hours after giving the first dose. It is very doubtful whether, by doing only three assays to cover a twelve-hour period, he could hope to detect, with any certainty, fluctuations in these levels which might only last, for example, from ten to sixty minutes. Surely, a serious study would call for assays to be carried out at least every half hour during the period of the experiment?

Science Information Department, Smith, Kline & French Laboratories, Ltd. London, S.E.5. R. S. FORREST.

CAUTIONARY CARDS

SIR,—Your note on A New Cautionary Card (May 3, p. 975) might cause some of your readers to infer that your original editorial remarks [3] went unheeded, and that our friends, the Americans, have beaten us to it once again. May I therefore point out that it was largely because of your earlier remarks that this Company decided to issue special cards for distribution by clinics and consultants to patients undergoing long-term treatment with the anticoagulant 'Dindevan' (phenindione).

Two small cards contained in a transparent plastic wallet are issued. One bears the patient's name and address, indicates clearly that he is undergoing treatment with the drug, and gives the name, address, and telephone number of the physician under whose direction he is taking it. It is also clearly stated that this physician should be informed in an emergency and consulted before dental or surgical treatment is undertaken. On the back of the card is a space for the insertion of the patient's blood-group.

The second card was designed to meet the needs of patients who have been discharged from the hospital but still have to return to an outpatient clinic for regular prothrombin-time estimations and possibly readjustment of the dose. This card bears columns for the insertion of the date, prothrombin time, and dose. It also serves as an appointment card for the patient's next visit to the clinic.

These cards have been available since last October and are being widely used by many anticoagulant clinics. We have no information as to when our American colleagues introduced their cards. What is important is that cautionary cards are available in Britain, and will be willingly supplied to any consultant or clinic requiring them.

Evans Medical Supplies, Ltd., Liverpool. ARNOLD WORLOCK.

*** We are glad to draw attention (if belatedly) to this useful British initiative.—Ed.L.

1. Crawford, R. McG. C., Grieg, K., Sutherland, A. M. *Scot. med. J.* 1957, **2**, 451.
2. Butler, T. C., Mahaffee, C., Wadell, W. J. *J. Pharmacol.* 1954, **111**, 425.
3. *Lancet*, 1956, ii, 1143.

DEATH OF A BOXER

SIR,—Dr. Byrom (May 10) rightly draws attention to boxing as a source of serious injury and death. There must be many who share his regret that so little is done to keep this matter before the public, especially before parents. The facts are plain enough and the inference to be drawn from them is important.

In many games there is a risk of injury. Footballers and cricketers are occasionally killed. Players accept these risks freely and the rules are partly designed to keep the chance of injury low. Injury, when it does occur, is accidental. It is otherwise with boxing. In this sport alone it is the single purpose of the boxer to defeat his opponent and the best way to do this is by knocking him out. The more we know about the structure and function of the brain the more we should understand the utter folly of allowing young people to sustain repeated head injuries. Postmortem studies show that petechial hæmorrhages often accompany cerebral concussion and involve a loss of nerve-cells.

There is another aspect of the question which is harder to write about because of the value judgments that are involved. Overt aggression expressed in a socially acceptable form is apt to arouse strong emotions. The spectators of boxing experience these emotions in a manner that apparently runs parallel with the severity of the beating being taken by the loser. The cries for blood and for the coup-de-grace fall ill upon the ears of a civilised community when pain and suffering are at stake. There are other ways of experiencing the relief that expressing these feelings can give.

Anything that can be done to inform the public will help the time when boxing will cease to be regarded as a worthwhile sport. Doctors and others who work with young people might well decide where they, as individuals, stand in this matter. There is much that they can do.

Charterhouse, Godalming. J. A. WAYCOTT.

SIR,—Dr. Byrom's letter recalls to mind the important annotation on cerebral injuries during boxing that appeared in *The Lancet* on May 27, 1950, and a letter from me that you kindly published on June 10 of that year (p. 1089). In it, I urged that a referee should not hesitate to stop a contest in which a man was being severely punished and particularly when uneven skill made a complete knockout only a question of minutes or seconds. Unfortunately this relative safeguard against serious cerebral injuries is not being universally practised.

In an amateur boxing contest, which was televised last week, one opponent was described by the commentator as inexperienced and having had only twelve contests, and the other one as very tough and experienced and having had over one hundred contests, most of which he had won. The disparity was soon obvious in the performance, but nevertheless the referee permitted the inexperienced contestant to continue boxing after he had taken two counts of eight seconds, with the easily predictable sequence that the poor victim was very soon knocked out completely and carried to his corner by his seconds.

Until otherwise competent referees acquire the courage and judgment to stop such contests earlier, and until the crowds and the contestants learn to accept such intervention as wise and humane, boxing will continue to be associated with a greater degree of risk than is necessary.

I put forward similar views in a letter to the *British Medical Journal* (of Jan. 8, 1955, p. 102) and concluded

that in spite of such preventive measures of prudency "trials of skill, endurance, and courage will still remain in very full measure for those who enter the ring in combat".

London, W.1. S. LEONARD SIMPSON.

STRAMONIUM POISONING

SIR,—It goes without saying that we patients must pay a price for the heroic doses of stramonium used in the treatment of parkinsonism (90–120 minims of the tincture, or 3 pills, t.d.s.). In my experience that price is vomiting of a peculiar nature:

The attack is heralded by 3–5 days' obstinate constipation, associated with some rectal flatus. It begins about midnight and may awaken the patient. Starting gradually, it works up to a climax when the vomiting is copious, after which it ceases abruptly. The vomit is dark brown and contains little, if any, food residue. The most characteristic feature is the vomiting of lengths of thick mucus, obviously the result of gastritis. The attack ends with the passing of three to five motions of normal size in 36 hours.

The way to avoid this unpleasant effect of stramonium is to keep the bowels open while giving this drug.

F.R.C.S.E.

A POSSIBLE MODE OF ACTION OF INTRINSIC FACTOR

SIR,—It is a matter of great interest that the oral therapy of pernicious anæmia has been successfully achieved by Dr. Heathcote and Dr. Mooney (May 10) with a vitamin-B_{12}-peptide isolated from a fermentation of streptomyces. One must bear in mind, however, that in the initial period of the therapy a relatively high dosage of vitamin B_{12} was used and that a daily oral dose of 100 μg. of the vitamin itself will produce remission in patients with pernicious anæmia.

I find it difficult, however, to agree with the statement that the effectiveness of the peptide indicates the fact that intrinsic factor probably does not exist. On the contrary, it appears that there may now be another link in the chain of a series of observations indicating the possible role of the factor itself. It could be that it is concerned in the conversion of vitamin-B_{12}-protein complexes, which in themselves are not absorbed, to vitamin-B_{12}-peptide complexes which can be absorbed. This is supported by the fact that raw liver contains vitamin-B_{12}-peptides and oral therapy with this material is successful; here again one must bear in mind the question of dosage. Moreover, a vitamin-B_{12}-mucoprotein complex has been prepared from hog gastric mucosa [1] and proved successful in the oral therapy of pernicious anæmia whilst in an impure state; with further purification, clinical activity was lost. We have shown [2] that the original impure material contained a mucoprotein, which behaved on electrophoresis very much like our own intrinsic-factor preparations. It is interesting to note, therefore, that the vitamin-B_{12}-mucoprotein complex was effective in oral therapy only when given at the same time as material which could have been intrinsic factor.

Our own intrinsic-factor preparations* produce remission with only 5 μg. vitamin B_{12} daily and do not have proteolytic activity. The particular type of activity envisaged in the conversion of a vitamin-B_{12}-protein complex into a vitamin-B_{12}-peptide complex would therefore involve intrinsic factor as one of the components of an enzyme system and not necessarily as the enzyme itself.

One very real difficulty in relation to the above suggestion is the fact that Holdsworth [3] has prepared a protein of molecular weight approximately 40,000, which complexes with vitamin B_{12} and is capable of bringing about its absorption. The vitamin-B_{12}-binding power is only half the theoretical value and it is possible that one half of the complex molecule plays a part in the intestine in breaking down the other half to a vitamin-B_{12}-peptide.

Department of Pathology, King's College, University of Durham; in the Royal Victoria Infirmary, Newcastle upon Tyne. A. L. LATNER.

1. Andresen, J. G. *Acta pharm. tox., Kbh.* 1954, **10**, 241.
2. Latner, A. L., Mertills, R. J., Raine, L. *Biochem. J.* 1956, **63**, 501.

GENETICS AND BLOOD MORPHOLOGY IN AMAUROTIC IDIOCY

SIR,—The occurrence of vacuoles in the cytoplasm of between 5% and 20% of the lymphocytes in juvenile amaurotic idiocy was first reported by Bagh and Hortling.[4] This was confirmed by Rayner [5] who also reported similar findings in the parents and some of the siblings of patients with juvenile amaurotic idiocy.

Further data have now been collected covering all patients with juvenile amaurotic idiocy who have been admitted to hospital during 1950–56 in Sweden. Their parents, siblings, nephews and nieces, and in-laws have also been examined personally by one of us (S. R.). For each individual at least 300 lymphocytes have been studied in ordinary Giemsa-stained blood-smears.

The results, which are given in the accompanying table, indicate that lymphocytes with vacuoles are an important sign of the disease. If present in small proportions (i.e., about 1–2% in a healthy individual, they indicate heterozygosity, but their absence does not disprove heterozygosity. Neither does their presence prove it, for vacuoles in the lymphocytes may be seen in other conditions—infectious diseases and at least some of the other lipoidoses. Whether or not heterozygotes for these also have vacuolised lymphocytes is at present being investigated here.

The utility of this sign can be seen in the following case. A brother of a patient with juvenile amaurotic idiocy married

3. Holdsworth, E. S. *ibid.* 1957, **66**, 59p.
4. Bagh, K. V., Hortling, H. *Nord. med.* 1948, **38**, 1072.
5. Rayner S. *Acta genet.* 1952, **3**, 1.

LYMPHOCYTES WITH VACUOLES IN PATIENTS WITH AMAUROTIC IDIOCY AND THEIR CLOSE RELATIVES AND IN-LAWS

Category (relationship to propositi)	No. examined	No. with vacuolisation		Average % vacuolised lymphocytes
		observed	expected*	
Homozygotes (propositi + secondary cases)	29	29	29	17·7
Heterozygotes: parents of propositi	43	31	43	2·1
Normal siblings	46	18	31	1·6
Normal nephews and nieces—both parents with lym. vac.	4	3	3	1·4
Normal nephews and nieces—one parent with lym. vac.	12	4	6	2·5
Normal nephews and nieces—parents without lym. vac.	10	1	0	1·3
In-laws married to siblings	14	1†	?	1·3
No. examined	158			

*Assuming manifestation in all homozygotes and heterozygotes and a fully efficient diagnostic method.

†This individual is the mother of the family reported in the text. This family, with the exclusion of the now diseased child, also appears in the 4th row of the table.

an unrelated woman. Both were found to have lymphocytes with vacuoles—2% and 1·3% respectively. They had five children, all apparently healthy. There were no vacuoles in the lymphocytes of one child and 1·0–1·6% in three. However, the remaining girl, aged 5 years, had 17% lymphocytes with vacuoles. At a follow-up examination 2 years later, this girl was found to display typical signs of the disease.

The investigation is continuing with examination of various control groups to assess how far this method is critically diagnostic and how it may be improved.

S. RAYNER
State Institute for Human Genetics, Uppsala, Sweden. J. A. BÖÖK.

STAPHYLOCOCCAL INFECTION IN INFANCY

SIR,—I refer to the annotation on this subject in your issue of Feb. 1. It is there stated that it is not known how long hospital epidemic strains taken home by mothers and babies persist in the community.

In 1949 I published a report on a widespread outbreak of staphylococcal infections [1] originating in maternity units which were caused by what is now known as phage-type 57 but was then referred to as type W. I there reported a number of instances of long persistence of the epidemic strain in families. The following is an example:

Family no. 1.—"Baby developed pustules when 10 days old. Boils on head at 90 days. Mother had boils on hips. Father had boils on neck when baby four months old. Grandmother living with family also had boils on face and hands. The baby developed further pustules when 10 months old and the grandmother more boils on the face: swabbing this family gave the following results: Baby, pustule and nose, W positive; Mother, throat and nose, W positive; father, throat, W positive; Grandmother, boil and nose, W positive."

Instances are there quoted of carriage up to eighteen months.

During the past four years we have had several experiences of families carrying hospital-acquired types (particularly type 81), and intermittently developing boils, &c., for even longer periods of time.

Shaughnessy Hospital, Vancouver, British Columbia. J. C. COLBECK.

DUODENAL ULCER AND THE ABO BLOOD-GROUPS

SIR,—In 1953 Aird et al.[2] demonstrated an association between the ABO blood-groups and cancer of the stomach, group A being significantly commoner in patients with the disease than in controls. An increased frequency of blood-group O in patients with peptic ulcer was found also by Aird et al.[3] and in patients with duodenal ulcer by Clarke,[4] and by Køster et al.[5]

I have compared the distribution of ABO groups in patients with duodenal ulcer with that in healthy persons from the same localities. The numbers are necessarily small, and the results can only be on the borderline of statistical significance; but individual series are often helpful, since large collected statistics of uneven accuracy may miss points of importance.

Of 147 patients with a duodenal ulcer, 110 were of the same social class (Civil servants). The diagnosis was confirmed by serial radiographs. The remaining 37 were all patients under the surgical unit of the Municipal Hospital of Athens, and were operated on by the same surgeon. The ages of the patients ranged from 20 to 70 years.

For the controls I selected 157 persons. 110 were mostly friends and relatives of the patients, the rest were volunteer blood-donors registered in the blood-bank of the Greek Red Cross. The patients and controls were inhabitants of Athens, but were born in different parts of Greece, and were probably representative of the whole population.

In the patients with duodenal ulcer, in both sexes combined, the overall frequency of blood-group O was 42·1% and that of group A 40·1% (table I); the corresponding figures in the controls were 43·3% for group O and 42% for group A.

TABLE I—BLOOD-GROUPS IN PATIENTS WITH DUODENAL ULCER

Blood-group	O	A	B	AB
No. of patients	62(*42·1*%)	58(*40·1*%)	22(*14·8*%)	5(*3·4*%)
Difference from % in controls	−1·2	−0·9	+2·8	+3·3

A statistical analysis of these results was made, comparing the frequency of group O in the controls and in the patients with duodenal ulcer. The application of the test of independence, at significance level $P=0·05$, gave $\chi^2=0·92$. This indicates that the likelihood of a duodenal ulcer developing is no greater in group-O than in group-A individuals.

Table II suggests that group O preponderates in men with duodenal ulcer and group A in women with duodenal ulcer. Similar results were found in the controls.

TABLE II—GROUPS O AND A IN PATIENTS WITH DUODENAL ULCER

Sex and blood-group	Men		Women	
	O	A	O	A
No. of patients	47(*44·3*%)	40(*37·7*%)	15(*36·5*%)	18(*43·1*%)

I analysed these data and found a standard deviation of 0·09 for the difference in group O between male and female. Since the total number of patients was much greater than 30 I applied the test of Gauss–Laplace to the difference. I found that $t=0·83$ and $P=20·33$.

There is thus no real evidence of a difference in the frequency of distribution of group O between men and women with duodenal ulcer.

I record my sincere appreciation of the help I received from Mr. Const. Athanasiadis, professor of statistics, High School for Financial Studies, Athens.

Clinic of Therapeutics, University of Athens. GEORGE PAPAYANNOPOULOS.

ORAL DIURETICS

Mr. JOHN H. FINGERHUT, deputy managing director, Merck Sharp & Dohme Ltd., writes:

"Your editorial on oral diuretics (May 10, p. 1005) was noted with interest, and in particular the mention of our new drug chlorothiazide ('Saluric'). The basic N.H.S. cost of 8 g. of chlorothiazide was unfortunately incorrectly quoted. This should have been 7*s.* 6*d.* and not 9*s.* 10½*d.* Your readers may like to know that the average basic N.H.S. cost of chlorothiazide for maintenance treatment of patients with cardiac œdema is 3*s.* 9*d.* per week."

Medicine and the Law

Damages for Death After Penicillin

A farmer, aged 34, was known to be sensitive to penicillin, but by mistake a nurse gave him a penicillin injection and he died.[1] Damages of £17,500 were originally claimed, but in view of the fact that the widow would inherit £5000 from her husband's estate, this figure was reduced to £12,500 with costs, to which the hospital board agreed.

1. *Birmingham Post*, May 8, 1958.

1. Colbeck, J. C. *Canad. med. Ass. J.* 1949, **61**, 557.
2. Aird, I., Bentall, H. H., Roberts, J. A. F. *Brit. med. J.* 1953, i, 799.
3. Aird, I., Bentall, H. H., Mehigan, J. A., Roberts, J. A. F. *ibid.* 1954, ii, 315.
4. Clarke, C. A. *Lancet*, 1955, i, 544.
5. Køster, K. H., Sindrup, E., Seele, V. *ibid.* 1955, ii, 52.

Obituary

JAMES HARPER

M.A., M.B. Glasg., F.R.F.P.S.

Dr. James Harper, consulting surgeon in diseases of the throat, nose, and ear to the Glasgow Royal Infirmary, died on April 27.

He was born in Glasgow and educated there. At first he intended to become a teacher, and after graduating M.A. from the University of Glasgow in 1906 he went to Jordanhill Training College; but before he had completed his course there he made up his mind to become a doctor, and returned to the university to study medicine. After graduating M.B. in 1909, he spent some years in postgraduate study abroad in Vienna, Berlin, and London, where he was a clinical assistant at the London Central Throat Hospital, the Golden Square Throat, Nose, and Ear Hospital, and the aural department of the London Hospital. In 1916 he returned to Glasgow and joined the staff of the ear, nose, and throat department at the Royal Infirmary. Three years later he became chief surgeon to the department.

S. Y., who was his assistant and successor, writes:

Dr. Harper's arrival on the Glasgow Royal Infirmary staff coincided with a new approach to diseases of the throat, nose, and sinuses. At this time, the physician was largely replaced by the surgeon in dealing with these conditions, and Dr. Harper's early pioneer work is still known to his colleagues. He was, in addition, an enthusiastic teacher of his specialty and a close student of the association of infective throat, nose, and ear conditions with many aspects of general medicine. Those of us who knew him found him an inspiring teacher and a keen exponent of clinical research.

Dr. Harper leaves a widow and four sons, three of whom are doctors.

GERALD ROBINSON

F.R.C.S.

Mr. Gerald Robinson, consulting surgeon to the South Devon and East Cornwall Hospital, Plymouth, died on March 20.

He was born in London in 1882 and was educated at Marlborough College and Guy's Hospital, where he was awarded the treasurer's gold medal for clinical surgery in 1903. After qualifying in 1904 he held the appointments of out-patients' officer and house-surgeon at Guy's Hospital and clinical assistant at the Evelina Hospital for Sick Children. He took the F.R.C.S. in 1907 and the same year settled at Plymouth in partnership with the late Dr. Hughes. In 1911 he was appointed assistant surgeon to the South Devon & East Cornwall Hospital. During the 1914–18 war he served as a captain in the R.A.M.C. on the staff of the Fourth Southern General Hospital, Plymouth. He was consulting surgeon to the East Cornwall Hospital, Bodmin, and to the Liskeard, Fowey, Kingsbridge, and Totnes hospitals. He was president of the Plymouth Medical Society for a term.

Outside his profession he had many interests. An expert metal worker, he was a member of the Guild of Silversmiths. He was also a skilful fisherman, a good shot with both shot-gun and rifle—he competed at the National Rifle Association meetings at Bisley—and a keen ornithologist and wildfowler.

Mr. Robinson's first wife died in 1955, and he was married again in 1956 to Miss Helen Campbell MacLashan.

G. L. P. writes:

Modest and retiring, and reserved almost to the point of shyness at times, Mr. Robinson always avoided publicity, a trait that endeared him even more to his friends but one that was often misunderstood by those who did not know him so well. There is an old saying, "A successful man is known during his lifetime but a great man is known only after his death." To be a great man and a successful man during a lifetime is surely the highest tribute that can be paid to one as deserving as Gerald Robinson.

Prof. GEOFFREY RAKE

E. C.-J. writes:

I knew Geoffrey Rake at two periods of his career. In the first period, at Guy's Hospital in the twenties, he suddenly became a source of amazed admiration to his contemporaries. As a student he was shy and retiring, though a persevering cross-country runner, and handicapped by a bad stammer. His first-class intellect was slow in developing, so he had difficulty in passing his early exams. The transformation came almost overnight, under the inspired and inspiring guidance of Adrian Stokes, then professor of pathology at Guy's. Geoffrey shot ahead, and was soon laden with medals. Success gave him confidence but did not improve his stammer, which remained an impassable obstacle to clinical practice. He was obviously cut out for research, so nobody was surprised when he departed to the laboratories of Johns Hopkins.

In the States—we heard years later—there was some confusion over his salary. He was not the man to send out distress calls, and for a year or so he earned only a bare living wage. I do not know the details, but it was a grim business that probably left a permanent mark on Geoffrey's character.

In 1952 I met him again. He was then director of research of the Squibb Institute in New York. He had played an invaluable part, I believe, in the American development of large-scale penicillin production, in collaboration with Fleming and Florey. I had met him only once or twice, at reunion dinners, since we both qualified. But when I tied myself into a financial bow-knot through miscalculating the cost of living in the United States, a phone-call to Geoffrey's New York office brought his immediate and generous aid. He descended on our hotel (my family was over for a few weeks), like a fairy godfather, and wafted us all away to stay with him in New Jersey.

Millstone, where the Rake family lived, is a colonial township made of wood, painted a brilliant white. The houses are mostly made of overlapping oak boards, like old Kent cottages, and the church is a wooden replica of the Wren churches in the Strand. The Rakes lived in "Main Street"—there was one shop and (I think) two other houses in it—and Geoffrey was the mayor. This was a serious appointment and Geoffrey took it seriously. It seemed to us that he took everything too seriously. Miraculously, he had entirely overcome his stammer. But the fifteen years had changed him into a grimly determined man, with a single-minded interest in the development of the antibiotics, which he shared with his near neighbour, Professor Waksman, of Rutgers University, of streptomycin fame, with whom we occasionally commuted from New Brunswick to New York.

Appointments

COOK, E. H. L., M.B. Lpool, F.R.C.S., D.O.M.S.: consultant ophthalmologist, St. Paul's Eye Hospital, Liverpool.

EDWARDS, J. D. E., M.B. Lpool, D.O.M.S.: part-time assistant ophthalmologist, Victoria Central Hospital, Wallasey.

KELLY, J. A., M.B., N.U.I., D.P.H.: deputy M.O.H., Dover.

LITTLER, T. R., M.D. Lpool, M.R.C.P.: part-time consultant physician, Victoria Central Hospital, Wallasey.

PLUMLEY, T. A., M.B. Lond., D.P.H., D.OBST.: deputy M.O.H. and deputy principal school M.O., Eastbourne.

Colonial Appointments:

ALAKIJA, O. B., M.R.C.S., D.P.H.: P.M.O., Federation of Nigeria.

CAMPBELL, I. D., M.B. Edin., F.F.A.R.C.S.: medical specialist (anæsthetist), Jamaica.

COCHRANE, J. S., M.R.C.S., D.A.: C.M.O., Gibraltar.

MCGREGOR, ALAN, M.B. Durh., D.P.H., D.T.M. & H.: A.D.M.S., Tanganyika.

NORMAN-WILLIAMS, C. M., M.B. Edin., D.P.H., D.T.M. & H.: deputy chief medical adviser, Federation of Nigeria.

PAULL, H. S., M.B. Brist., D.P.M.: specialist (psychiatrist), Northern Nigeria.

VALENTINE, E. J., M.B., D.P.H., T.D.D.: medical specialist (tuberculosis), Jamaica.

VASSILOPOULOS, V. P., M.B. Athens: A.D.M.S., Cyprus.

WALTER, D. C., M.B. Aberd., D.C.P., M.R.C.P.E.: assistant bacteriologist, Jamaica.

Notes and News

AN ALL-IN FAMILY SERVICE

THE problems and needs of the family are causing concern today, but the Council for Children's Welfare and the Fisher Group, in a pamphlet[1] based on their evidence to the Ingleby Committee, point out that among all our social services there is none with a special responsibility for the family as a unit. At present different services deal with the different problems of different members of the family, and too often the underlying factor which may be causing ill health, delinquency, or even disruption of the family goes unrecognised and untreated. These independent, self-contained services tend to cause delay, duplication, and lack of continuity in the help they offer, and because each has been set up to deal with a particular need, they are usually remedial rather than preventive. The Council and the Group agree that the committees which coordinate the work of the different services of the local authorities and voluntary organisations have proved valuable, but in their view coordination can never be a substitute for a concentration of responsibility. They therefore propose that a family service should take over the existing children's departments, and extend their work from the care of deprived children to the care of the family as a whole.

The help of the proposed service would be available to any family, whether self-reliant or inadequate. It would seek to safeguard the social wellbeing of the family and offer help to the "well" family exposed to strain as well as providing early treatment for the "sick" family. It would work in close cooperation with the present health, education, welfare, and youth employment service, and it would hope to find families in need of support through school officers, teachers, and family doctors. It would have pleasant local offices which parents would be encouraged to visit for help and advice. The new service, it is suggested, might be run by a family care committee for each local authority and it would be appropriate for it to come under the general supervision of the Home Office.

The idea of offering the family more support from fewer hands is attractive; but the proposed new service would apparently still turn to the other social services for specialist help. Each time it did so, it would in effect be putting another caller on the family's doorstep. It would best justify its existence by reducing the family's need for such outside help. It would require, its sponsors believe, legislation before it could be started, and then it would be necessary to find social workers to clothe its administrative bones. In the meantime many local authorities have already arranged for some of their workers to take a special responsibility for their problem families as families, and, as Dr. Scott's recent London survey[2] showed, have made at least a beginning with preventive work among them.

REWARDS AND MERIT

SPEAKING at the conference of the Institute of Hospital Administrators in London on May 5, Sir James Lythgoe said that in attracting staff the National Health Service, with limited and often restricted resources, would, even in normal times, and still more in times of inflation, be at some disadvantage when competing with the large flexible resources of industry. This disadvantage could be increased if the service was also encumbered with an unduly rigid code of rules and regulations, and he believed that it was especially important to give those who were running it as much flexibility and freedom of action as possible. If the service was to compete effectively for people of ability and enterprise he believed that there should be less emphasis on guaranteed uniform treatment regardless of zeal and efficiency, and greater emphasis on differentiated rewards. He would like to see less fragmentation of salary scales and greater opportunity to recognise ability by acceleration of increases within scales, more use of merit awards beyond normal maxima, and "also power to retard advancement (and use made of it) in cases of unsatisfactory performances of duties or lack of zeal . . . salary scales, as they have evolved in the public services in recent years, give insufficient opportunity to reward merit on the one hand or penalise inefficiency on the other".

1. Families with Problems. 1958. Pp. 36. 2s. Obtainable from the Council for Children's Welfare, 23, Tillingbourne Gardens, London, N.3.
2. Scott, J. A. *Lancet*, Jan. 25, 1958, p. 204.

HOSPITALS 1948-58

OPENING the same conference and the International Hospital Equipment and Medical Services Exhibition in London on May 5, Mr. Derek Walker-Smith, the Minister of Health, said that on July 5 ten years ago nearly 3000 hospitals were taken over by the Ministry. Some of them were world-famous, with fine standards and traditions; but many left much to be desired. Nearly all had suffered from inevitable neglect due to the war and its economic aftermath. Many beds were closed because of shortage of staff. "Because the amount of resources that could be devoted to the hospital service had to be and remains inevitably limited, these ten years have essentially been a period of renewal and redeployment rather than of wide expansion. But it has been a fruitful period in which much progress has been made in improving the service, both from the point of view of quantity and quality. In the sphere of hospital construction and improvement we are going actively ahead in spite of economic limitations. The last few years especially have seen a gratifying rise in the amount of money available for this purpose. In money, there was been an upward curve as follows: 1955–56, £10 million; 1956–57, £13 million; 1957–58, £18 million; 1958–59, £20 million; 1959–60, £22 million. Many old hospitals have been improved and upgraded to provide a district service with a full range of specialties. The number of consultants has increased by nearly 33%—from 5191 at the end of 1949 to 6902 at the end of 1957. Between 1949 and September, 1957, the number of available staffed beds rose from 448,000 to 474,500—an increase of 6%. Much more significant and important than the rise in the number of beds is, however, the rise in the use made of them. It is an indication, at least in part, of efficiency in management that the increase of 6% in the number of available beds has been accompanied by a rise of 27% in the number of inpatients treated."

STRESS IN GENERAL PRACTICE

LAST October a joint conference was held of the London faculties of the College of General Practitioners and the Society of Psychosomatic Research. We gave some account of the proceedings[1] which have now been published verbatim.[2]

MIDDLESEX HOSPITAL MEDICAL SCHOOL

AMONG the new English medical-school buildings will be that of the Middlesex Hospital, for work has begun at a corner of New Cavendish Street.[3] The first phase will cost all the £970,000 that has so far been raised through donations, grants, and covenants; it includes a block of five storeys to house teaching laboratories, lecture theatres for all the preclinical departments, a more spacious lecture theatre seating 400, and a physiology demonstration room of circular stepped design. This block will be complete in September, 1959, when the council hopes to have raised the £530,000 needed for the next phase—an eight-storey block containing research laboratories, common-rooms for students and staff, and a diningroom. Later still, a residential college is planned, with rooms for a third of the school's 450 students. The new buildings will be grouped round a courtyard with a fountain and flowers; they should prove much more convenient and pleasant to work in than the present cramped, scattered, and unplanned quarters.

CLINICAL PSYCHIATRIC UNIT AT SHEFFIELD

As a joint venture of the board of governors of the United Sheffield Hospitals and the University of Sheffield, a department of psychiatry has been established under the direction of Prof. E. Stengel. It was started in a limited way in 1956 with a 7-bed ward unit at the Royal Infirmary and outpatients

1. *Lancet*, 1957, ii, 782.
2. The Problems of Stress in General Practice. Supplement to the *Journal of the College of General Practitioners*, vol. 1, no. 2. London, 1958. Pp. 44. 3s. 6d.
3. *Times*, May 9.

clinics at the Royal Infirmary and Royal Hospital. A main clinical unit has now been provided by converting a former reablement centre at a cost of £75,000, to be met in part from the board's capital allocation from the Ministry of Health and in part from the board's endowment fund.

The unit is pleasantly situated in semirural surroundings on the outskirts of Sheffield and stands in its own spacious grounds. It has 29 beds in small wards, and a treatment unit. Built-in fittings include a patient/nurse call system. As many of the patients will be up and about during the day, a hanging clothes locker has been provided for each patient. Each ward has its own patients' sitting-room, with writing-tables, wireless, and television. On the ground floor one wing has been equipped as a diagnostic and therapy centre for outpatients and accommodation is provided for a day hospital where patients can attend for treatment during the daytime, returning at night to their own homes. A communal dayroom and diningroom have been included for the use of inpatients and those attending the day hospital. A sliding partition between these two rooms can be opened to make a room large enough for film shows and group therapy. The interior decoration has been chosen to give a calm and restful effect in wards, with a bold use of colour and design in other areas to produce a stimulating contrast. A sectional hut will house the occupational therapy department at the rear of the clinic. Residential accommodation has been provided within the building for medical, nursing, and domestic staff, and on the top floor rooms have been set aside for research.

APPROVED NAMES FOR DRUGS

THE British Pharmacopœia Commission has issued the following new supplementary list of approved names:

Approved name	*Other names*
Chlorphenoctium Amsonate	2 : 4-Dichlorophenoxymethyldimethyl-*n*-octylammonium amsonate (Amsonic acid is adopted as the trivial name for 4 : 4′-diaminostilbene-2 : 2′-disulphonic acid)
Chlorproguanil ..	N^1-3 : 4-Dichlorophenyl-N^5-*iso*propyldiguanide Lapudrine is the hydrochloride
Dextromoramide ..	(+)-1-(β-Methyl-γ-morpholino-αα-diphenylbutyryl)-pyrrolidine Jetrium; R.875
Dimethicone ..	A polydimethylsiloxane
Ethotoin	3-Ethyl-5-phenylhydantoin Peganone
Hydroxychloroquine	7-Chloro-4-[4-(*N*-ethyl-*N*-2-hydroxyethylamino)-1-methylbutylamino]quinoline Plaquenil is the sulphate
Isothipendyl ..	10-(2-Dimethylaminopropyl)-10-thia-1 : 9-diaza-anthracene Nilergex is the hydrochloride; Theruhistin is the hydrochloride
Levomoramide ..	(-)-1-(β-Methyl-γ-morpholino-αα-diphenylbutyryl)-pyrrolidine
Norethisterone ..	17β-Hydroxy-19-norpregn-4-en-20-yn-3-one 17α-Ethynyl-17β-hydroxyoestr-4-en-3-one 17α-Ethynyl-19-nortestosterone Norlutin; Primolut N
Pecazine	10-(1-Methyl-3-piperidylmethyl)phenothiazine The name Pacatal is applied to the hydrochloride and the acetate
Perphenazine ..	1-[3-(2-Chloro-10-phenothiazinyl)propyl]-4-(2-hydroxyethyl)piperazine Fentazin; Trilafon
Phenactropinium Chloride	*N*-Phenacylhomatropinium chloride Trophenium
Poskine	Propionylhyoscine Proscopine is the hydrobromide
Racemoramide ..	(±)-1-(β-Methyl-γ-morpholino-αα-diphenylbutyryl)-pyrrolidine
Ristocetin ..	Antimicrobial substances produced by *Nocardia lurida* Spontin contains Ristocetin A and Ristocetin B
Salinazid	*N-iso*Nicotinoyl-*N*′-salicylidenehydrazine Nupa-sal
Sulphaproxyline ..	N^1-(4-*iso*Propoxybenzoyl)-*p*-aminobenzenesulphonamide
Tacrine	5-Amino-1 : 2 : 3 : 4-tetrahydroacridine
Triamcinolone ..	9α-Fluoro-11β : 16α : 17α : 21-tetrahydroxypregna-1 : 4-diene-3 : 20-dione 9α-Fluoro-16α-hydroxyprednisolone Aristocort; Ledercort
Tropigline ..	Tiglyltropine

FRIENDS SERVICE COUNCIL

THE Council's report [1] for 1957 gives some idea of the variety of work done in Europe, Asia, and Africa—houses have been built, schools and training institutions carried on, water supplies extended, displaced villagers resettled, refugees cared for, clothing distributed. The medical work of the Council has included tuberculin tests and B.C.G. inoculations, health education, and antenatal and postnatal clinics in South Korea—where the medical programme closed in December—and the training of nurses and the building of a new tuberculosis ward at a mission hospital in Kenya. The Council (Friends House, Euston Road, London, N.W.1) invites legacies, donations, and covenanted subscriptions to enable it to continue its work; expenditure exceeded income by £10,786 last year, and the deficit this year is expected to be about £15,000, which will make serious inroads into its legacy reserve fund.

University of Oxford

On May 1 the degree of B.M. was conferred on M. F. Burfoot.

University of Birmingham

The university will hold a degree congregation on July 17 on the occasion of the annual conference of the British Medical Association in Birmingham, over which Prof. A. P. Thomson, dean of the faculty of medicine, will preside. The honorary degree of LL.D. will be conferred on Lieut.-General Sir Alexander Drummond; the honorary degree of D.SC. on Dr. J. S. Mitchell, regius professor of physic in Cambridge University; and the honorary degree of M.D. on Dr. I. D. Grant, president of the College of General Practitioners.

Dr. Jean Mackintosh at present part-time reader in the department of pædiatrics and child health has been appointed to a full-time post in the department of social medicine for three years from July 1. She will undertake an investigation to be financed by a grant from the Nuffield Provincial Hospitals Trust into administrative problems in the public medical services particularly under the National Health Service Acts.

University of St. Andrews

Lord Kilmuir, rector of the university, opened a research unit for midwifery, gynæcology, orthopædic surgery, anæsthetics, and dermatology in Dundee on May 3. The unit is housed in a former students' hostel in Dudhope Terrace, and Prof. R. B. Hunter, dean of the faculty of medicine, said that people might wonder why these buildings were being put up away from the college. The reason was that in ten years they hoped to have a new medical school and hospital. The research units were being started as "islands of excellence" where people could be trained to staff the new institution.

Royal College of Surgeons of England

At a meeting of the council on May 8, with Sir James Paterson Ross, the president, in the chair, it was announced that Sir Russell Brain had accepted the honorary fellowship of the college.

The Jacksonian prize was presented to Mr. B. B. Milstein. A Hunterian professorship was awarded to Mr. J. Bryant Curtis (Melbourne), and the Begley prize was awarded to Mr. Robert Cohen (London Hospital Medical College).

Postgraduate diplomas and diplomas of membership were conferred on the candidates named in the report of the comitia of the Royal College of Physicians (*Lancet*, May 3, 1958, p. 975). Diplomas of membership were also conferred on D. L. Common, Maxwell Lindsey, and A. R. Molyneux.

Royal College of Physicians of Edinburgh

At a meeting of the college on May 6, with Dr. A. Rae Gilchrist, the president, in the chair, the following were elected to the membership:

J. B. Stanton, J. A. Simpson, K. K. Das, Gopal Sharan, A. K. Ganguly, J. A. M. Joyce, William Davison, W. F. K. Morrow, N. S. Capstick, Mohammed Siddique, S. K. Vaish, Nellie P. Fernando, N. W. J. England, T. O. Ogunlesi, P. E. Goonewardena, N. J. Shah, E. M. Salama, Keitha Corlett, N. A. E. Samaan, P. J. Koblenzer, Neville Berlyne, C. R. Maddock, J. D. Todd, John Stevenson, G. I. G. Joag, D. J. Patel, Iftikhar Ahmad, A. D. Cameron, N. H. Korner, N. B. Sabiel, F. E. Udwadia, A. J. Gazder, M. W. McNicol, S. S. Rikhy, Iqbal Ahmed, P. C. Nag, M. A. Qureshy, D. A. Whiting, B. K. Roy, B. D. Patel.

1. Friends Service Council: Report for 1957. Pp. 24.

Royal College of Surgeons of Edinburgh

At a meeting of the college on May 9, with Prof. John Bruce, the president, in the chair, the following were admitted to the fellowship:

E. G. Ahern, R. M. Anderson, M. S. Bansel, J. S. G. Blair, P. S. Boulter, M. C. Desia, W. M. Hefni, T. V. Hingorani, E. A. Ingram, Harold Jackson, M. M. A. Kader, B. H. Kelham, J. R. Kirkpatrick, Phillip Lebon, W. W. J. Liddle, W. A. A. G. Macbeth, G. B. McKelvie, M. R. Morris, D. A. O'Rourke, L. S. Parker, B. C. Paton, G. G. Powell, G. L. Ritchie, J. W. Rodwell, J. B. van Schalkwyk, B. P. Scrivener, S. J. Seevaratnam, M. M. Sinclair, Keshmahinder Singh, Lucas Souvlis, N. W. Struthers, J. D. Thompson, J. C. Usdin, G. A. Whitefield, D. B. B. Whitehouse, W. W. Wilson, C. I. Woolf, M. K. A. Youssef.

European Association Against Poliomyelitis

The next meeting of this Association will be held at Madrid from Sept. 28 to 30. Further information may be had from the secretary of the U.K. Committee for Poliomyelitis, Royal College of Physicians, Pall Mall East, London, S.W.1.

Advisory Committee on Medical Research in Scotland

The Secretary of State for Scotland has appointed the following five new members to this committee: Prof. Dugald Baird, Prof. D. M. Douglas, Prof. T. Ferguson Rodger, Prof. E. J. Wayne, and Dr. D. J. Finney.

Nursery School Association

This Association is holding a conference at County Hall, London, S.E.1, on June 20 at 9.45 A.M. The theme is to be Mens Sana—the Real Foundation. Further particulars may be had from Dr. David Morris, 1, Park Crescent, Portland Place, London, W.1.

Surgery of Leprosy

The Friends of Vellore are holding a meeting at 1, Wimpole Street, London, W.1, on Wednesday, June 18, at 5.15 P.M., when Mr. Paul Brand, of the Vellore Christian Medical College, South India, will speak on reconstructive surgery in leprosy.

The International Children's Centre

For doctors this centre is organising a course in nutrition, to be held in Paris for four weeks from Sept. 15. The course will be in French. Applications should be sent to Dr. Nathalie P. Masse, director of studies of the centre, Château de Longchamp, Bois de Boulogne, Paris 16e.

Society of Medical Officers of Health

Teaching Group.—This group, which has lately been set up under the chairmanship of Prof. Fraser Brockington, is to hold its first conference on June 13 and 14, at the Ciba Foundation, 41, Portland Place, London, W.1. The speakers will include Prof. Thomas McKeown, Dr. J. M. Mackintosh (future of the medical services and its implications for the teaching of social medicine); Dr. C. W. Dixon, Dr. J. B. Meredith Davies (content of social medicine); and Prof. Alexander Mair, Dr. John Burton (teaching methods). Further particulars may be had from the secretary of the group, Dr. Burton, Central Council for Health Education, Tavistock House, W.C.1.

Medical Student Journals

Last Saturday a conference of editors of medical student journals was held at B.M.A. House in London by the British Medical Students' Association. Mr. Michael Hall, editor of the *British Medical Students' Journal*, took the chair, and at the morning session talks on editing and on printing were given by Dr. T. F. Fox and Mr. John Hunter. The afternoon session was opened by Mr. M. Cozens, of the advertisement department of the B.M.A.; and editors and representatives of student journals then gave shorter communications. In the evening members of the conference were entertained to dinner by *The Lancet*.

Dr. John Burton has resigned from the medical directorship of the Central Council for Health Education, and Dr. A. J. Dalzell-Ward, who has been deputy medical director of the council since 1952, will succeed him.

On Friday, May 30, at 8.30 P.M., at the Southend General Hospital, Mr. Rodney Maingot will give the Sydney Body lecture for 1958. He is to speak on surgery in art.

Colonel J. B. George, late R.A.M.C., has been appointed honorary physician to the Queen, in succession to Major-General Douglas Bluett, who has retired.

Dr. G. H. Wright, of King's College, university lecturer in anatomy has been elected into an official fellowship at Clare College, Cambridge.

Mr. V. B. Green-Armytage has been promoted to be an officer of the Legion of Honour.

CORRIGENDUM.—*The Treatment of Sports Injuries.* Copies of this film, which we reviewed last week (p. 1029), may be had, free of charge, from Smith & Nephew Ltd., Medical & Technical Information Department, Bessemer Road, Welwyn Garden City, Herts.

Diary of the Week

MAY 18 TO 24

Monday, 19th

POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12
4 P.M. Dr. F. R. Keating: Diagnosis of Hyperparathyroidism.
WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY, St. Mary's Hospital Medical School, W.2
5 P.M. Dr. R. G. White: Cellular Aspects of the Immune Response.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1
5 P.M. Prof. A. Bradford Hill: Problems of Experiments in Man. (First Harben lecture.)
MARLBOROUGH DAY HOSPITAL, 38, Marlborough Place, N.W.8
8.15 P.M. Dr. E. M. Bluestone (New York): Social Psychiatry—a critique.
MANCHESTER MEDICAL SOCIETY
9 P.M. *General Practice.* (Manchester Medical School.) Dr. C. V. Brown: All Change. (Presidential address.)

Tuesday, 20th

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8 P.M. *Medicine.* Dr. D. A. K. Black, Prof. Graham Bull, Dr. John Goodwin: Clinical and Laboratory Assessment of Water and Electrolyte Disturbances.
INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Dr. Phyllis Wade: Radiation.
INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
3 P.M. (Hammersmith Hospital, Ducane Road, W.12.) Prof. J. L. Wright (Dunedin): Modern Management of Placenta Prævia.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE
5 P.M. Professor Bradford Hill: Controlled Trials of Vaccines. (Second Harben lecture.)
BRITISH ASSOCIATION OF SPORT AND MEDICINE
5.30 P.M. (Middlesex Hospital Medical School, W.1.) Mr. A. E. H. Kendall: Athletes and Adaptation to Stress.

Wednesday, 21st

MEDICAL RESEARCH COUNCIL, NATIONAL INSTITUTE FOR MEDICAL RESEARCH, The Ridgeway, Mill Hill, N.W.7
5 P.M. Prof. J. Waldenström (Lund): The Porphyrias.
ROYAL SOCIETY OF MEDICINE
5 P.M. *Comparative Medicine.* Dr. A. P. Donald, Dr. Eliot Slater: Use of Twin Studies in Research.
POSTGRADUATE MEDICAL SCHOOL
2 P.M. Dr. D. G. Evans: Immunisation Against Poliomyelitis.
INSTITUTE OF DISEASES OF THE CHEST, Brompton, S.W.3
5 P.M. Dr. Joseph Smart: Unilateral and Localised Emphysema of the Lung.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Miss C. Hodges: Radiation.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE
5 P.M. Professor Bradford Hill: Influenza and the Common Cold. (Last Harben lecture.)
MANCHESTER MEDICAL SOCIETY
4.30 P.M. *Pathology.* (Manchester Medical School) Dr. J. E. Kench: Aminoaciduria.

Thursday, 22nd

ROYAL SOCIETY OF MEDICINE
8 P.M. *Urology.* Mr. H. E. Lockhart-Mummery, Mr. J. D. Fergusson, Mr. C. G. Scorer: Vesico-intestinal Fistulæ.
POSTGRADUATE MEDICAL SCHOOL
4 P.M. Prof. O. L. Wade: Output of the Heart in Exercise.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. R. W. Riddell: Epidemiology of Fungus Infections.
INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
3 P.M. (Chelsea Hospital for Women, Dovehouse Street, S.W.3.) Professor Wright: Exotics in Ectopics.
HONYMAN GILLESPIE LECTURE
5 P.M. (University New Buildings, Teviot Place, Edinburgh.) Dr. J. W. Farquhar: The Child of the Diabetic Mother.
UNIVERSITY OF ST. ANDREWS, Queen's College, Dundee
5 P.M. Prof. J. T. Louw (Cape Town): Observations on Cancer of the Uterine Body.

Friday, 23rd

POSTGRADUATE MEDICAL SCHOOL
10 A.M. Mr. Dillwyn Thomas: Observations on the Postoperative Care of Thoracotomy Cases.
ST. MARY'S HOSPITAL MEDICAL SCHOOL, W.2
5 P.M. Dr. J. O. Martin: Relief of Fœtal Anoxia.
INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
2 P.M. (Queen Charlotte's Hospital, Goldhawk Road, W.6.) Mr. John Hewitt: Variations on an Old Theme.

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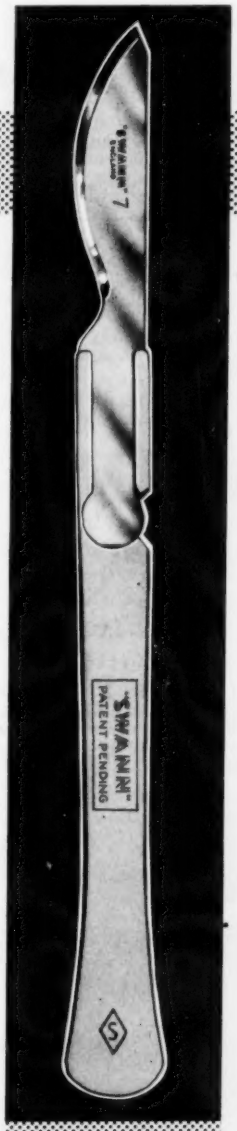

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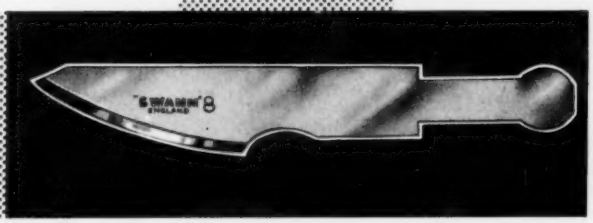

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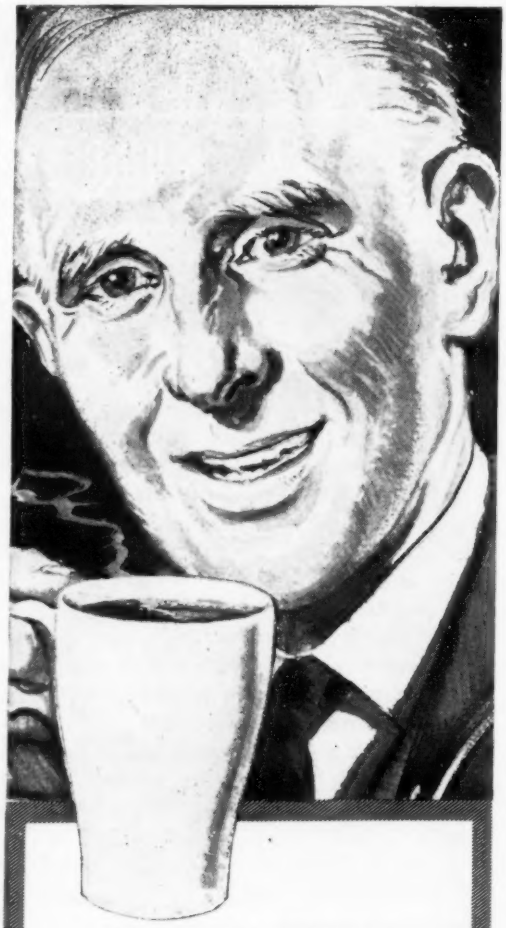

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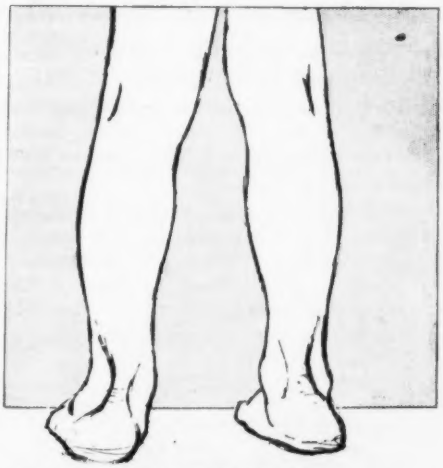

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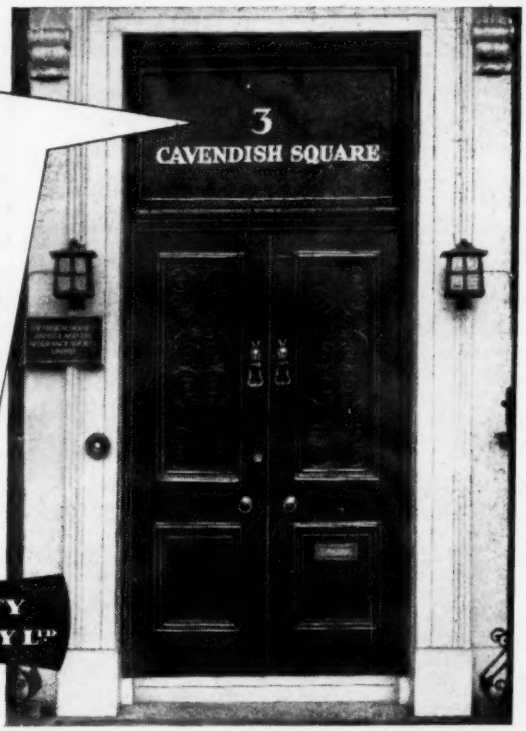

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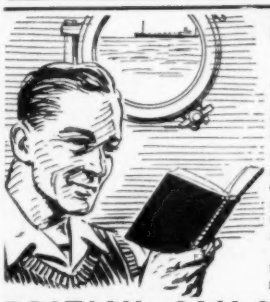

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Academic and Educational

UNIVERSITY OF MANCHESTER
FACULTY OF MEDICINE

DIPLOMA IN PSYCHOLOGICAL MEDICINE

A COURSE in preparation for the Diploma in Psychological Medicine will commence in October, 1958, subject to a sufficient number of candidates being available. The instruction is part-time covering 3 half-days per week for 8 terms.

Further particulars as to admission and fees may be obtained from the Dean of Postgraduate Medical Studies, The University, Manchester, 13, to whom applications for entry to the course should be made not later than Monday, 30th June.

DICKINSON SCHOLARSHIPS

Applications are invited for a TRAVELLING RESEARCH SCHOLARSHIP IN MEDICINE, to the value of not more than £1500, tenable for 1 year.

Candidates, who must be graduates of a university in the United Kingdom, must have done their clinical training as students of the Manchester Royal Infirmary.

Copies of the regulations governing the Scholarships may be obtained from the undersigned, to whom 6 copies of application should be sent not later than 14th June, 1958.

C. C. WHITELAW,
Secretary to the Dickinson Scholarship Trustees.
Manchester Royal Infirmary, Manchester, 13.

MENTAL HEALTH RESEARCH FUND FELLOWSHIPS

Applications are invited for MENTAL HEALTH RESEARCH FUND FELLOWSHIPS from suitably qualified persons wishing to pursue Full-time Research Work bearing on problems of mental health whether in clinical psychiatry or in one of its supporting sciences.

Both Junior and Senior Fellowships are offered in the salary ranges £700–£1200 and £1200–£2000, plus superannuation. The appointments will be for up to 3 years in the first instance.

Application forms, which must be returned before 1st October, 1958, may be obtained, together with further information, from the Secretary, Research Committee, Mental Health Research Fund, 39, Queen Anne-street, London, W.1 (Tel. : WELbeck 1272).

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD

RESEARCH AWARDS FOR MEDICAL PRACTITIONERS HOLDING REGISTRAR APPOINTMENTS

The Western Regional Hospital Board offer up to 5 prizes of a maximum value of £50 each (to be used in defraying expenses in visiting a centre of study outwith the Region) for original work submitted not later than 31st March, 1959, by Registrars holding appointments in the Western Region. The submitted work should be in the form of an essay of not more than 10,000 words. One of the prizes will be available only to Registrars from peripheral hospitals.

Further details are obtainable on application to the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2.

UNIVERSITY OF OXFORD. Applications are invited for the post of SURGICAL TUTOR, tenable in the Radcliffe Infirmary, Oxford, for 3 years from 1st January, 1959, subject to a report on satisfactory progress at the end of each year. Applicants should possess a higher qualification in surgery and be of Senior Registrar or at any rate of equivalent status. They also should have teaching experience. The duties of the Surgical Tutor will be under the direction of the Nuffield Professor of Surgery. The salary is £1750 p.a., with F.S.S.U. and children's allowance of £50 per child.

Applications (10 copies) stating age, qualifications and experience, together with the names of 3 referees, should be sent to the Secretary of Faculties, University Registry, Oxford, to reach him not later than 30th June, 1958.

UNIVERSITY OF OXFORD. Radcliffe Infirmary. Applications are invited for the post of GRADUATE ASSISTANT IN BACTERIOLOGY. The successful applicant will be required to take part in the teaching of bacteriology to clinical students and to assist in the routine clinical bacteriology laboratory. Salary will be in the scale £900–£50–£1600, according to qualifications and experience, with family allowance and F.S.S.U. Duties to commence as soon as possible after appointment.

Applications, together with the names of 2 referees, should be sent, not later than 31st May, 1958, to Dr. R. L. VOLLUM, Radcliffe Infirmary, Oxford.

UNIVERSITY OF LONDON KING'S COLLEGE will require on 1st October, 1958, a LECTURER IN PHYSIOLOGY. The appointment will be on the Junior Lecturer scale of £850–£50–£1050, plus £60 London allowance, family allowances and F.S.S.U. benefits.

Particulars and application forms should be obtained from the Registrar, King's College, Strand, W.C.2. Completed applications should reach him by 30th May.

UNIVERSITY OF EDINBURGH. Department of Bacteriology. Applications are invited for the post of LECTURER in the Department of Bacteriology. The successful applicant will be expected to act mainly as an Assistant Bacteriologist in the Royal Infirmary of Edinburgh. Salary scale £900–£100–£1300 ; bar ; £1400–£100–£1900 p.a., with placement according to qualifications and experience, and with superannuation benefit and family allowance where applicable. The person appointed will be expected to take up duty on 1st July, 1958 (not 1st October as previously advertised).

Further particulars may be obtained from the undersigned, with whom applications (6 copies), giving the names of 2 referees, should be lodged not later than 31st May, 1958.

CHARLES H. STEWART, Secretary to the University.
April, 1958.

UNIVERSITY OF GLASGOW. Department of Infectious Diseases. Applications are invited for a LECTURESHIP IN EPIDEMIOLOGY in the Department of Infectious Diseases at Ruchill Hospital. Salary according to placement on University scale for clinical teachers. The final maximum on this scale is £1900 p.a. F.S.S.U. and family allowance benefits.

Applications (12 copies) should be lodged, not later than 14th June, 1958, with the undersigned, from whom further particulars may be obtained.

ROBT. T. HUTCHESON, Secretary of University Court.

UNIVERSITY OF ST. ANDREWS. The University Court hopes shortly to make an appointment to the MAITLAND RAMSAY POSTGRADUATE SCHOLARSHIP IN MEDICINE. Open to graduates who wish to carry out advanced study in some branch of medicine, preferably in ophthalmology, obstetrics, or gynæcology. Stipend £1000 p.a.; period of tenure 1 year, with possibility of extension.

Further particulars may be obtained from the undersigned, with whom applications for the Scholarship (10 copies), with names of 3 referees, should be lodged by 31st May, 1958.

D. M. DEVINE, Joint Clerk to the University Court.
College Gate, St. Andrews.

AUSTRALIA. UNIVERSITY OF QUEENSLAND. Applications are invited for the following positions:—

(i) CHIEF LECTURER (CLINICAL) IN SURGERY. Salary £A2980–£A3220 p.a. Applicants should hold a senior qualification in surgery and should have had teaching and research experience. The appointee will act as Chief Assistant to the Professor of Surgery.

Applications close 30th June, 1958.

(ii) SENIOR LECTURER (CLINICAL) IN MEDICINE. Salary £A2470–£A2820 p.a. The applicant should have a higher qualification in clinical medicine and preferably some experience of medical research.

Applications close 31st July, 1958.

(iii) SENIOR LECTURER IN SOCIAL AND PREVENTIVE MEDICINE (MEDICAL STATISTICS). Salary £A2160–£A2510 p.a. Applicants should hold a degree of a recognised University with specialised knowledge of statistics, and sound experience in the application of the principles of statistics to practical problems. Knowledge of and experience in medical statistics is desirable but not essential.

Applications close 30th June, 1958.

Further particulars are obtainable from the Secretary, Association of Universities of the British Commonwealth, 36, Gordon-square, London, W.C.1. Applications close, in Australia and London, as above.

Hospital Services: Senior Appointments

CHARING CROSS HOSPITAL GROUP. Wembley HOSPITAL. Part-time CONSULTANT PHYSICIAN. 2 sessions per week from 1st August, 1958.

Candidates, who must be Members of the Royal College of Physicians of London, should submit 10 copies of their applications, stating date of birth, qualifications and experience, and the names of 3 referees, to reach the undersigned by 16th June, 1958. FRANK HART, Secretary to the Board.

Charing Cross Hospital, W.C.2.

NEASDEN HOSPITAL (Infectious Diseases), Brentfield-road, N.W.10. Locum Tenens ASSISTANT PHYSICIAN (whole-time—Senior Hospital Medical Officer grade), 16th June–17th July, 1958, inclusive. Experience in general medicine and infectious diseases. Resident while on duty. The Hospital is a Regional Centre for poliomyelitis.

Applications to the Physician-Superintendent.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Maximum Part-time CONSULTANT SURGEON to Southend-on-Sea Group of hospitals. Residence in area a condition of appointment. Further particulars from Secretary, 11A, Portland-place, W.1.

Part-time CONSULTANT SURGEON for 2 sessions a week to Tottenham Group of hospitals. Duties mainly at The Prince of Wales's General hospital, N.15.

Part-time CONSULTANT PHYSICIAN for 2 sessions a week to Tottenham Group of hospitals. Duties will initially be mainly at The Prince of Wales's General Hospital, N.15.

Full-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade) to Runwell Hospital, near Wickford, Essex, with outpatient clinic at East Ham Memorial Hospital, E.7. House available on Runwell Estate.

Applications (6 copies), stating post(s) concerned, and names of 3 referees, should reach the Secretary, 11A, Portland-place, London, W.1, by Saturday, 14th June.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

1. CONSULTANT RADIOLOGIST, 3 half-days a week, West Herts (160 Beds) and St. Paul's (221 Beds) Hospitals, Hemel Hempstead. Attendances required on Mondays, Wednesdays, and Fridays.

Applications before 23rd June, 1958.

2. CONSULTANT OPHTHALMOLOGIST, 1 half-day a week, New End Hospital, Hampstead, N.W.3 (221 Beds).

Applications before 25th June, 1958.

Hospitals may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, London, W.1. Applications are invited for the appointment of Part-time CONSULTANT NEUROSURGEON (3 sessions a week). Candidates should have a special interest in spinal surgery, and duties will include the care of patients with head injury admitted to the Accident Unit at the Country Hospital.

Applications (1 copy), giving date of birth, qualifications and experience, and names of 3 referees, to be addressed to the House Governor by 14th June, 1958.

ROYAL FREE HOSPITAL GROUP. Applications are invited from registered dental practitioners for the post of Part-time CONSULTANT DENTAL SURGEON to the Royal Free Hospital Group for 2 sessions per week. Duties to commence 1st October, 1958.

Applications, stating details of qualifications, experience and giving the names of 3 referees, should be forwarded to the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 17th June, 1958.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a CONSULTANT DERMATOLOGIST for 1 notional half-day a week to the Camberwell Group of hospitals. Candidates must have had wide experience in dermatology and possession of a higher qualification is desirable. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staff (England and Wales). Applicants may visit the hospitals concerned.

Applications, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war or national service, together with the names and addresses of 3 referees, to be sent to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 31st May, 1958.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(*a*) Part-time CONSULTANT PHYSICIAN with special interest in geriatrics (3 notional half-days weekly). Duties at Bromsgrove General Hospital (2 notional half-days) and Smallwood Hospital, Redditch (1 notional half-day). Higher medical qualification required.

(*b*) Whole-time ASSISTANT PSYCHIATRIST, St. Margaret's Hospital, Birmingham (salary £1653–£2126 p.a.). Experience specialty essential. Resident.

Applications (15 copies), stating name, age, nationality, present and previous appointments and details of 3 referees, to Secretary, 10, Augustus-road, Birmingham, 15, by 16th June, 1958.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. CONSULTANT ANÆSTHETIST (7 notional half-days, with possibility of increase), King's Lynn area. Main hospital West Norfolk and King's Lynn General Hospital (146 Beds). Wide experience in specialty and higher qualification essential.

Applications (8 copies), stating age, experience and the names of 3 referees, to the Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 9th June, 1958. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee, Secretary, St. James' Hospital, King's Lynn.

LEEDS REGIONAL HOSPITAL BOARD.

CONSULTANT in Ophthalmology—Leeds and Otley (7 notional half-days per week). Duties at hospitals in the Leeds A Group, outpatient facilities at the Leeds Public Dispensary and Hospital and inpatients at St. James's Hospital, Leeds. Duties include 1 session per week at Otley General Hospital, and consultative work in connection with the School Eye Service. Relief duties as required at hospitals in the Harrogate and Ripon Group. The person appointed to reside in Leeds.

Whole-time ASSISTANT GERIATRICIAN (Senior Hospital Medical Officer grade)—Bradford. Duties under general direction of Consultant Geriatrician at hospitals in the Bradford A and B Groups (670 geriatric beds, including active admission unit of 80 beds at St. Luke's Hospital). Geriatric service established 5 years ago.

Whole-time ASSISTANT PSYCHIATRISTS (Senior Hospital Medical Officer grade).

Broadgate Hospital, Beverley, and associated Clinic at Beverley, Driffield, and Hull. Married accommodation may be available.

Menston Hospital, near Leeds (2500 Beds), and associated general hospitals. Accommodation for single person only.

Storthes Hall Hospital (2680 Beds), Kirkburton, near Huddersfield, and associated general hospitals. Resident or non-resident. Large modern flat available if required. Accommodation also available for single person.

Candidates for these Senior Hospital Medical Officer posts should normally hold a D.P.M., but applications will also be considered from candidates without previous experience in psychiatry who hold a higher qualification and have had wide experience in general medicine in the Senior Registrar grade and who intend to obtain a D.P.M. and specialise in psychiatry.

Applications (12 copies), stating age, qualifications, and details of present and previous appointments, with dates, and names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, by 10th June, 1958.

LIVERPOOL REGIONAL HOSPITAL BOARD. Applications are invited for the post of Part-time CONSULTANT E.N.T. SURGEON giving 7 notional half-days mainly at hospitals in the St. Helen's, Warrington, Ormskirk and Runcorn areas with some duties in the adjacent areas of Lancashire. Applicants should possess a higher qualification in surgery and have wide experience in E.N.T. surgery.

Forms of application from Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be returned not later than 7th June, 1958.

VINCENT COLLINGE, Secretary to the Board.

NEWCASTLE REGIONAL HOSPITAL BOARD. ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer), whole-time, for Prudhoe and Monkton Hospital for Mental Defectives (1156 Beds). This Hospital is subject to a major expansion programme; it serves parts of the counties of Northumberland and Durham, also the County Boroughs of Sunderland and Tynemouth. Total population 933,105. The appointment is vacant from 4th November, 1958, and is resident; a suitable house is available. Further particulars from Regional Psychiatrist.

Applications, together with names and addresses of 3 referees, to Regional Psychiatrist, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. ORTHOPÆDIC SURGEON (Senior Hospital Medical Officer status), whole-time, for Newcastle and Gateshead Groups of hospitals. Main hospitals W. J. Sanderson Orthopædic, Newcastle (122 Beds); Bensham, Gateshead (230 Beds); Queen Elizabeth, Gateshead (176 Beds).

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Locum CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST, 9 sessions per week, for Tees-side Group of hospitals for approximately 2–3 months.

Applications, with names and address of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, immediately.

NEWCASTLE REGIONAL HOSPITAL BOARD. CONSULTANT CHEST PHYSICIAN, whole-time, or part-time for 9 sessions per week, for South Shields Group of hospitals. Population served approximately 158,000.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS AND KING'S COLLEGE, UNIVERSITY OF DURHAM. ASSISTANT PHYSICIAN AND LECTURER IN MEDICINE. Applications are invited for the joint post of Assistant Physician at the Royal Victoria Infirmary, under the Board of Governors of the United Newcastle upon Tyne Hospitals and Lecturer in Medicine, King's College, University of Durham. The appointment will be of Consultant status and will be whole-time or maximum part-time by agreement with the selected candidate. The appointee will have responsibilities in a medical clinic where he will act as Assistant to the Head of the Clinic and will have teaching and other duties within the Department of Medicine of the University.

Applications, stating age, qualifications and experience, and giving the names and addresses of 3 referees, should be sent to the undersigned within 4 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.
Royal Victoria Infirmary, Newcastle upon Tyne.

MANCHESTER REGIONAL HOSPITAL BOARD. Whole-time or maximum Part-time CONSULTANT GROUP RADIOLOGIST to the Lancaster and Kendal Hospitals, &c. (Royal Lancaster Infirmary, Westmorland County Hospital, Kendal, and Queen Victoria Hospital, Morecambe). Wide experience essential, appointee to live in or near Lancaster.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 2nd June, 1958.

OXFORD REGIONAL HOSPITAL BOARD. Locum CONSULTANT RADIOTHERAPIST required during August and September at Northampton or Reading.

Apply now, stating age, qualifications, experience, and names of 2 referees, to Secretary, 43, Banbury-road, Oxford.

OXFORD REGIONAL HOSPITAL BOARD. Assistant RADIOTHERAPIST (Senior Hospital Medical Officer grade), whole-time, for the Northampton Area Department of Radiotherapy. Candidate should possess the D.M.R.(T.), and have had experience in radiotherapy. The department at Northampton General Hospital may be visited by arrangement with the Medical Director.

Applications (10 copies), stating age, qualifications, experience, and naming 3 referees, to reach the Secretary, Oxford Regional Hospital Board, by 6th June.

SHEFFIELD REGIONAL HOSPITAL BOARD. Maximum Part-time CONSULTANT ORTHOPÆDIC SURGEON required for the Rotherham and Mexborough Group of hospitals.

Application form and further details from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 7th June, 1958.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT PSYCHIATRIST required, to be designated Medical Superintendent of Balderton Hospital, near Newark, a new hospital (with 252 beds at present) for all grades of mental defectives.

Application form and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 15th June, 1958.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD invites applications for a post of CONSULTANT PSYCHIATRIST or MEDICAL PSYCHOLOGIST. The Consultant will be based at Inverness and the post is whole-time and non-resident. Under this new appointment specialised services will be given in the general and mental hospitals in the Region and in the development of child psychiatry. A qualification in psychology and experience in clinical psychology, child psychiatry or psychosomatic medicine will be advantages for the duties of the post.

Application forms and further particulars can be obtained from the undersigned, with whom applications should be lodged by 7th June, 1958.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.

Office of the Northern Regional Hospital Board,
Reay House, 17, Old Edinburgh-road, Inverness.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of Whole-time ASSISTANT PSYCHIATRIST at the Glasgow Royal Mental Hospital. Salary (at age 32 and over) on the scale £1653 15s.–£52 10s.–£2126 5s.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for a temporary post as an ASSISTANT ADMINISTRATIVE MEDICAL OFFICER to this Board. The duties will, in the main, be in connection with the planning of a new 600-Bed teaching hospital to be built in Dundee. The appointment will probably last for 4 years and there is on its termination a reasonable possibility of a permanent appointment in general medical administrative duties being available. Previous experience of hospital organisation and administration is essential. Salary £1485 15s.–£52 10s. (4)–£68 5s. (1)–£1764 p.a.

Forms of application and further particulars from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications should be lodged not later than 31st May, 1958.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment (whole-time or maximum part-time) of CONSULTANT in Physical Medicine to the Dartford and Medway and Gravesend Groups of hospitals. Candidates should have had considerable experience in the specialty. A higher qualification in medicine is essential and the appropriate diploma is desirable. Applicants may visit the hospitals concerned.

Applications, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war or national service, together with the names and addresses of 3 referees, to be sent to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 31st May, 1958.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time appointment of CONSULTANT PSYCHIATRIST AND RESIDENT PHYSICIAN-SUPERINTENDENT at Darenth Park, Dartford, Kent, which is used for the treatment of mental defective patients. Extramural work is also available. Candidates should possess a Diploma in Psychological Medicine, and preferably a higher qualification; mental defective experience is essential.

Applications, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, should be sent to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, by 7th June, 1958.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade, non-resident) at Graylingwell Hospital, Chichester, Sussex. Candidates should possess D.P.M. and have wide experience of inpatient and outpatient work in psychiatry.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 7th June, 1958. Applicants may visit Hospital by local arrangement.

DUBLIN. ST. LAURENCE'S HOSPITAL (Richmond, WHITWORTH AND HARDWICKE). Applications are invited for the position of CONSULTANT PATHOLOGIST who will be required to attend the Hospital for 4 or 5 sessions per week. Remuneration at the standard rate per session. Further particulars concerning the above position may be had from the Secretary of the Hospital.

Applications to be received not later than 1st July, 1958.

A. W. McDERMOTT, Secretary.

NAIROBI. THE AGA KHAN HOSPITAL. Applications are invited for the 2 following whole-time posts :—

1. PHYSICIAN, with experience in pædiatrics and tropical diseases.

2. SURGEON, with experience in obstetrics and gynæcology.

Salary at the rate of £2500 p.a., not more than 5% being deducted for house and furniture. 2-year contract, renewable. Superannuation provided for. Local leave annually. Passage paid out, and home at end of contract, including family if necessary. This new hospital in Nairobi is due to open in the early Autumn with at first 120 Beds. Plans exist for developing the Hospital as a multi-racial medical centre.

Applications, with the names of 2 referees, to be sent, not later than 9th June, to R. G. A. BEAUMONT, Secretary, Aga Khan Hospital, c/o St. George's Hospital, London, S.W.1.

NEW ZEALAND. THE OTAGO HOSPITAL BOARD. MEDICAL UNIT, DUNEDIN HOSPITAL, UNIVERSITY OF OTAGO. SENIOR ASSISTANT on the Clinical and Teaching Staff and LECTURER IN MEDICINE. Applications are invited for the position of Senior Assistant on the Medical Unit, Dunedin Hospital and University of Otago, from persons holding a degree in medicine of an approved university and who either :—

(*a*) Hold a higher qualification and have had 2 or more years' practical experience in medicine.

(*b*) Have been qualified for 6 years or more and have had 3 years' or more practical experience in medicine.

The Senior Assistant ranks as Lecturer or Senior Lecturer in Medicine and as a Junior Specialist and the salary payable is that under the Hospital Employment (Medical Officers') Regulations, viz £1640–£1940. The commencing rate of salary within the scale will be that determined by the Medical Officers' Salaries Grading Committee in accordance with the qualifications and experience of the appointee.

Applicants should have a good background in medicine. The position is non-resident, is full-time, and private practice is not permitted.

Conditions of appointment and application forms may be obtained from the Office of the High Commissioner for New Zealand, 415, The Strand, London, or from the undersigned. Travelling expenses will be paid in accordance with the table set out in the conditions of appointment.

Applications, stating age, qualifications and experience, together with health and radiological certificates and testimonials, will be received by the undersigned up to 10 o'clock A.M. on Monday, 28th July, 1958. W. A. WILLIAMSON, Secretary.

Otago Hospital Board,
P.O. Box 946, Dunedin, New Zealand.

NEW ZEALAND. HAWKE'S BAY HOSPITAL BOARD, NAPIER, NEW ZEALAND. Applications, closing on Thursday, 31st July, 1958, are invited from duly qualified medical practitioners, for the position of PATHOLOGIST to the Hawke's Bay Hospital Board. Salary in accordance with experience and qualifications:

Junior Specialist : £1640–£1940 p.a.
Senior Specialist :
(*a*) £2590–£2890 p.a.
(*b*) £2340–£2590 p.a.
(*c*) £2040–£2340 p.a.

(Commencing salary within these scales will be determined by the Salaries Grading Committee of the Department of Health.)

Conditions of appointment, and schedule of duties, may be obtained on application to the High Commissioner for New Zealand, London. R. P. NORTHE, Managing Secretary.

Hawke's Bay Hospital Board, Napier, New Zealand.

AUSTRALIA. AUSTIN HOSPITAL, Heidelberg. (Situated in Melbourne, Victoria, Australia.) Applications are invited from medical practitioners, preferably with postgraduate qualifications, and preferably with experience in medical rehabilitation of long-term illness, for the post of MEDICAL DIRECTOR, Spinal Unit. (Re-advertised.) The Spinal Unit is newly developed, with 52 Beds, within the Austin Hospital, Heidelberg, as the recognised paraplegic treatment centre for the State of Victoria. Initially the appointment will be for 3 years, but, subject to satisfaction by both parties will be regarded as a permanent appointment. The duties are full-time, with limited right of consultant practice on prescribed terms. Salary will begin at the rate of £3000 (Aust.) p.a., rising by 2 increments to £3250 (Aust.) p.a. Expense of transfer of appointee and his family to Australia will be met by the Hospital. Superannuation and study leave conditions apply.

A schedule giving details of the post will be made available upon inquiry to the Agent-General for Victoria, Victoria House, Melbourne-place, The Strand, London, W.C.2.

By order of the Committee of Management.

W. M. POWELL, Manager and Secretary.

WESTERN AUSTRALIA. ROYAL PERTH HOSPITAL. Applications are invited for the full-time post of DIAGNOSTIC RADIOLOGIST. Candidates must be fully qualified Radiologists and preference will be given to those with higher qualifications. The status of the post approximates to that of a full-time Consultant in the National Health Service in Great Britain. Salary £A3100 p.a., subject to rise and fall of cost-of-living adjustments. The Royal Perth Hospital (650 Beds) is the principal teaching hospital affiliated with the recently established Medical School in the University of Western Australia. A memorandum of further particulars concerning this post will be supplied on request to the undersigned, or to the Agent-General for Western Australia, Savoy House, London, W.C.2. Dr. M. G. F. Donnan, Radiologist, of Perth, is now visiting Britain—April and May—and may be contacted c/o the Agent-General. The selected applicant will be required to furnish a satisfactory medical certificate and clear chest X-ray.

In addition to all relevant personal details, applications must include particulars of qualifications, experience, the names of 2 referees, and should reach the Agent-General for Western Australia, Savoy House, 115–116, Strand, London, W.C.2, as early as possible but not later than 31st July, 1958.

JOSEPH GRIFFITH, Administrator.

Hospital Services: Junior Appointments

ANNIE McCALL MATERNITY HOSPITAL, Jeffreys-road, S.W.4. Applications are invited from registered Women medical practitioners for the post of RESIDENT OBSTETRIC HOUSE SURGEON. Post recognised for the D.Obst.R.C.O.G. Appointment is for a period of 6 months, vacant 16th June, 1958.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of 3 recent testimonials, to the Secretary, not later than 31st May, 1958.

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. CASUALTY OFFICER. Resident. Vacant 31st May, 1958. Senior House Officer grade.

Apply, enclosing copies of 2 recent testimonials, to Hospital Secretary, with whom arrangement can be made to view the Hospital.

BETHNAL GREEN HOSPITAL, Cambridge Heath-road, E.2. HOUSE PHYSICIAN, pre-registration post.

Applications, stating experience, and copies of 2 testimonials, to Hospital Secretary.

CAMBERWELL HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for appointment to the undermentioned recognised pre-registration posts which fall vacant on 1st July, 1958:—

(1) At **Dulwich Hospital** (in association with King's College Hospital Medical School for teaching purposes), **East Dulwich-grove, S.E.22**
HOUSE OFFICER (general medical duties)—3 positions.
HCUSE OFFICER (general surgical duties)—3 positions.

(2) At **St. Giles' Hospital, Camberwell, S.E.5**
HOUSE OFFICER (general medical duties)—1 position.
HOUSE OFFICER (general surgical duties)—1 position.
HOUSE OFFICER (orthopædic duties)—1 position.

Applications, giving age, qualifications and details of previous post (if any), with copy testimonials or names of 2 referees, to be sent to the Group Secretary, Camberwell Hospital Management Committee, Dulwich Hospital, East Dulwich-grove, S.E.22, not later than 28th May, 1958.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, London, N.W.10. RESIDENT HOUSE OFFICER (post-registration) required in Obstetrics and Gynæcology Department. Post recognised for D.Obst.R.C.O.G. and M.R.C.O.G. Post vacant 1st July, 1958.

Applications, with 2 testimonials, to Medical Director by 24th May, 1958.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (whole-time) required in General Medical and Cardiological Department of above Hospital. Experience in chest and heart diseases desirable. Opportunity for research work. Resident when on duty. Appointment for 1 year, renewable. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, Park Royal, N.W.10, by 27th May, 1958.

CHARING CROSS HOSPITAL. Wembley Hospital. (135 Beds.) SURGICAL REGISTRAR (resident) required as soon as possible. Fellowship desirable, F.R.C.S. recognised.

Apply immediately to the undersigned.

FRANK HART, Secretary to the Board.

COLINDALE HOSPITAL, Colindale-avenue, London, N.W.9. (300 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time SURGICAL REGISTRAR, resident or non-resident, required at above Hospital. F.R.C.S. and previous experience an advantage. Post vacant 1st July, 1958. Work covers surgical treatment of pulmonary, orthopædic, urinary, and tuberculous and non-tuberculous chest diseases. The Hospital is situated within easy reach of central London and may be visited by arrangement with Physician-Superintendent.

Application forms obtainable from and returnable to Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, Edgware, Middlesex, by 24th May, 1958.

DREADNOUGHT SEAMEN'S HOSPITAL, Greenwich, S.E.10. HOUSE SURGEON (pre-registration) required immediately.

Applications, stating age, nationality, qualifications and experience and giving the names of 3 recent referees, should be sent to the Secretary at the above address as soon as possible.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1 (ROYAL FREE HOSPITAL GROUP). Applications are invited from pre-registration and registered Women medical practitioners for the post of FIRST HOUSE PHYSICIAN for medicine and paediatrics, to become vacant 1st July, 1958. Appointment for 6 months. Salary in accordance with Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to The Secretary, Elizabeth Garrett Anderson Hospital, by 21st May, 1958.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1 (ROYAL FREE HOSPITAL GROUP). Applications are invited from pre-registration and registered Women medical practitioners for the post of SECOND HOUSE PHYSICIAN. Appointment for 6 months from 1st July, 1958. Salary according to Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to The Secretary, Elizabeth Garrett Anderson Hospital, by 21st May, 1958.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1 (ROYAL FREE HOSPITAL GROUP). Applications are invited from pre-registration and registered Women medical practitioners for the post of FIRST HOUSE SURGEON, with charge of general surgical beds. Appointment for 6 months from 1st July, 1958. Salary according to Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to The Secretary, Elizabeth Garrett Anderson Hospital, by 21st May, 1958.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1 (ROYAL FREE HOSPITAL GROUP). Applications are invited from pre-registration and registered Women medical practitioners for the post of OBSTETRIC HOUSE SURGEON (recognised for the M.R.C.O.G.). Duties to commence 1st July, 1958. Appointment for 6 months. Salary in accordance with Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, to be sent to The Secretary, Elizabeth Garrett Anderson Hospital, by 21st May, 1958.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of SECOND HOUSE SURGEON. Appointment for 6 months, from 1st July, 1958. Salary according to Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 21st May, 1958.

GUY'S HOSPITAL, S.E.1. Applications are invited for the post of REGISTRAR in the Children's Department with duties at the Evelina Hospital for Sick Children. Appointment as soon as possible until 30th September, 1959, in the first instance.

Forms of application are obtainable from, and should be lodged with, the Superintendent, Guy's Hospital, S.E.1, not later than 2nd June, 1958.

HAMPSTEAD GENERAL HOSPITAL, Haverstock-hill, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from registered medical practitioners for the post of RESIDENT CASUALTY OFFICER (graded as Senior House Officer). Salary £819 10s. p.a. Vacant 1st July, 1958, tenable for a period of 6 months at the Main Outpatient Department, Bayham-street, N.W.1.

Application forms may be obtained from the Administrative Assistant, to whom they should be returned, together with copies of 3 recent testimonials, by 30th May, 1958.

HAMPSTEAD GENERAL HOSPITAL, Haverstock-hill, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited for the pre-registration post of NON-RESIDENT CASUALTY OFFICER (medical or surgical) vacant 1st July, 1958, tenable for a period of 6 months.

Application forms may be obtained from the Administrative Assistant, to whom they should be returned, together with copies of 3 recent testimonials, by 30th May, 1958.

HAMMERSMITH HOSPITAL AND INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY, AND NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Joint appointment. Whole-time REGISTRAR in Obstetrics and Gynæcology required 1st July, 1958. Appointment tenable for minimum period of 2 years, of which the first year will be spent at the Luton Maternity Hospital and Luton and Dunstable Hospital, Luton (resident), and the second year at the Hammersmith Hospital and Institute of Obstetrics and Gynæcology (non-resident).

Application forms obtainable from and returnable to the Group Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, Beds.

HITHER GREEN HOSPITAL, Hither Green, London, S.E.13. HOUSE PHYSICIAN required 17th June for duties in Infectious Diseases and General Medicine. Recognised pre-registration post.

Applications, with references from medical school, &c., to the Senior Physician.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited from pre-registration or registered medical practitioners (Male) for the appointment of HOUSE PHYSICIAN, to become vacant on Monday, 30th June, 1958. Appointment will be for a period of 6 months. National Health Service salary.

Applications to reach the Secretary on or before Monday, 2nd June, together with copies of 3 recent testimonials.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Required to commence at the end of June, 1958, Full-time SURGICAL REGISTRAR (Male). The possession of the Diploma of Fellow of one of the Royal Colleges is desirable. Honorarium at the rate of £850 p.a. Appointment will be for a period of 12 months.

Further particulars may be obtained from the Secretary, to whom applications with the names of 3 referees, should be sent on or before Tuesday, 27th May.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited from pre-registration or registered medical practitioners (Male) for the appointment of HOUSE SURGEON to the Midwifery and Gynæcological Departments, to become vacant on 2nd June. Appointment will be for a period of 6 months. National Health Service salary.

Applications to reach the Secretary on or before 20th May, 1958, together with copies of 3 recent testimonials.

KING EDWARD MEMORIAL HOSPITAL, Ealing. SENIOR HOUSE OFFICER (resident—general surgery). Vacant 1st June. Recognised for F.R.C.S.

Applications, giving age, qualifications with dates and experience, together with copies of 2 recent testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, Middlesex, by 23rd May, 1958.

KING EDWARD MEMORIAL HOSPITAL, Ealing. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (whole-time) for Casualty, Fracture and Orthopædic Departments. Resident or non-resident. Vacant 20th August, 1958. Recognised for 6 months' casualty work for F.R.C.S. examination. Candidates may visit the Hospital by direct appointment.

Application forms obtainable from and returnable to the Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, Middlesex, by 16th June, 1958.

LAMBETH HOSPITAL, Kennington, S.E.11. Applica-tions are invited from pre-registration and registered medical practitioners for the position of RESIDENT HOUSE SURGEON vacant 5th June, 1958. Hospital recognised for F.R.C.S. Successful candidate will be required to carry out a fortnight's locum duty starting 22nd May, 1958.

Application forms from the Hospital Secretary.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applica-tions are invited from pre-registered and registered medical practitioners for the appointment of RESIDENT OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON. Appointment for 6 months from 1st July, 1958. It would be convenient if successful candidate could carry out fortnight's locum duty commencing 17th June, 1958. Hospital recognised for M.R.C.O.G. and D.Obst.R.C.O.G.

Application forms from the Secretary. Self-addressed envelope should be enclosed.

MEMORIAL HOSPITAL, Shooters Hill, S.E.18. Senior HOUSE OFFICER (anæsthetics). The post provides good experience and is recognised for F.F.A. R.C.S. and D.A. 6 months' resident appointment and may then be renewed.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

METROPOLITAN HOSPITAL, Kingsland-road, London, E.8. Applications are invited from registered medical practitioners for the post of RESIDENT SENIOR HOUSE OFFICER (anæsthetist). The post is recognised for the F.F.A. R.C.S.

Apply, stating age, nationality, qualifications and experience, together with 2 testimonials, to the Hospital Secretary.

MILE END HOSPITAL, Bancroft-road, London, E.1. (479 Beds.) HOUSE PHYSICIAN (pre- or post-registration). Post vacant immediately.

Application forms, obtainable from Physician-Superintendent, to be returned by 30th May, 1958, with copies of not more than 3 testimonials.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited for the post of RESIDENT MEDICAL OFFICER, vacant 2nd July, 1958, at Maida Vale Hospital for Nervous Diseases, London, W.9. Registrar grading. Appointment in the first instance for 6 months, renewable. Preference will be given to a candidate holding a higher degree.

Applications, giving the names of 3 referees, to be sent to the Secretary at the Maida Vale Hospital, W.9, not later than 31st May, 1958.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON at The National Hospital, Queen-square, London, W.C.1, to commence 1st July, 1958. This post carries the grade of Registrar. The appointment will be for 6 months in the first instance.

Applications, with names of 3 referees, to be sent to the undersigned not later than 30th May, 1958.

H. EWART MITCHELL,
Secretary to the Board of Governors.

The National Hospitals for Nervous Diseases,
Queen-square, London, W.C.1.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of REGISTRAR (whole-time) to the Lysholm X-ray Department at The National Hospital, Queen-square, London, W.C.1, to commence 1st July, 1958, or as soon as possible thereafter. This post carries the grade of Registrar. Applicants should hold a Diploma in Diagnostic Radiology and have had experience in general radiology. The appointment will be for 6 months in the first instance.

Applications, with names of 3 referees, to be sent to the undersigned not later than 30th May, 1958.

H. EWART MITCHELL, Secretary to the Board of Governors.

The National Hospitals for Nervous Diseases,
Queen-square, London, W.C.1.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. HOUSE OFFICER (resident—medical or surgical) to the Neurosurgical Department at the Maida Vale Hospital for Nervous Diseases, London, W.9. Appointment in the first instance for 6 months. Grading as Senior House Officer or Registrar according to experience.

Applications, giving the names of 3 referees, to be sent to the Secretary at the Maida Vale Hospital, W.9, not later than 2nd June, 1958.

NEASDEN HOSPITAL (Infectious Diseases), Brentfield-road, N.W.10. Whole-time Locum Tenens REGISTRAR, from 18th to 25th July, 1958, inclusive. Resident; or resident on duty—approximately alternate nights. Experience in all types acute infectious diseases, including poliomyelitis

Applications to Physician-Superintendent.

NELSON HOSPITAL, Kingston-road, Merton, S.W.20. RESIDENT ANÆSTHETIST (Senior House Officer grade) with certain duties as House Physician in the Children's Ward and Casualty Department. Post recognised for D.A. Vacant 21st May.

Applications, stating age, qualifications and experience, with copies of testimonials and the name of 1 referee, should be sent to the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

NORTH MIDDLESEX HOSPITAL, London, N.18. Applications are invited for the post of ADMISSIONS OFFICER (Senior House Officer grade). 6 months' appointment, with possibility extension to 1 year. Non-resident. Vacant 1st July. A busy post in a new department. Evenings and weekends (from 1 P.M. Saturday) free.

Applications, with full details and copies of recent testimonials or names of 2 referees, should reach the Secretary of the Hospital not later than 29th May.

PADDINGTON GENERAL HOSPITAL, Harrow-road, W.9. Applications are invited for the post of Locum Tenens SENIOR REGISTRAR in Orthopædics.

Applications, stating age, qualifications, experience, together with names and addresses of 2 referees, to the Hospital Secretary immediately.

POPLAR HOSPITAL, East India Dock-road, E.14. HOUSE SURGEONS (2). Pre-registration posts. Duties include inpatient and outpatient work. Recognised for F.R.C.S.

Applications, with copy of at least 1 testimonial, should be sent to Hospital Secretary immediately.

PRINCESS BEATRICE HOSPITAL, Earls Court, London, S.W.5. Applications are invited from registered medical practitioners for the post of CASUALTY OFFICER with Anæsthetic duties. Senior House Officer grade, recognised for F.R.C.S. Vacancy 1st July, 1958.

Applications, stating age, qualifications, with 3 testimonials, to House Governor, within 14 days from date of advertisement.

PRINCESS BEATRICE HOSPITAL, Earls Court, S.W.5. Applications are invited from registered medical practitioners for the post of HOUSE PHYSICIAN for 6 months (Senior House Officer grade), resident. Opportunity to serve a further 6 months as Obstetric Gynæcological House Surgeon in the same grade. Vacancy 21st June, 1958.

Applications, with 3 testimonials, to House Governor, within 14 days from date of advertisement.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS. ANÆSTHETIST (Senior House Officer), resident post tenable for 6 months from 1st August, 1958, in the first instance, for duties at both hospitals. Post recognised for the purpose of the F.F.A.R.C.S.

Applications to the House Governor immediately on forms available from 339, Goldhawk-road, London, W.6.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. SENIOR HOUSE SURGEON (Senior House Officer grade) required for 6 months commencing 5th June, 1958. Post recognised for F.R.C.S.

Applications, with the names of 3 referees, to Group Secretary, West Ham Group Hospital Management Committee, Stratford, E.15, by 23rd May, 1958.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. HOUSE SURGEON (pre-registration) required for 6 months commencing 2nd July, 1958.

Applications, with copies of recent testimonials, to Hospital Secretary by 23rd May, 1958.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. HOUSE PHYSICIAN (pre-registration) required for 6 months commencing 2nd July, 1958.

Applications, with copies of recent testimonials, to Hospital Secretary by 23rd May, 1958.

REGIONAL NEUROSURGICAL CENTRE. (66 Beds.) BROOK GENERAL HOSPITAL, Shooters Hill-road, S.E.18. SENIOR HOUSE OFFICER (neurosurgery). Vacant 1st July. Post recognised for F.R.C.S. and D.P.M. and provides excellent opportunity for training in neurology.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ROYAL FREE HOSPITAL. Applications are invited for the post of SURGICAL REGISTRAR at the Royal Free Hospital. Duties to commence on 1st July, 1958. Appointment for 1 year in the first instance. Candidates should be registered medical practitioners of not more than 10 years' standing and Fellows of the Royal College of Surgeons.

Formal application, giving details of experience, &c., together with the names of 3 referees, should be sent to the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 21st May, 1958.

ROYAL MARSDEN HOSPITAL, Fulham-road, London, S.W.3. Applications are invited from registered medical practitioners for the post of HOUSE SURGEON (resident). Salary £577 10s. p.a. Post is tenable for 6 months from mid-June.

Forms of application are obtainable from the House Governor, to whom applications, together with copies of 3 recent testimonials, should be sent before 27th May.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Orthopædic Surgery to fill a vacancy in the approved trainee establishment at the Camberwell Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staff (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience, with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 31st May, 1958.

SOUTH WESTERN HOSPITAL, Landor-road, S.W.9. HOUSE PHYSICIAN (registered or pre-registration) required. Combined tuberculosis and acute medicine. Post vacant 16th June, 1958.

Form of application from the Secretary, to be returned by 24th May, 1958.

SPRINGFIELD HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required. The Hospital is a large one and offers excellent experience in diagnosis and treatment of all forms of mental disorder including the neuroses. Every variety of modern treatment is carried out in a well-equipped treatment centre. Single accommodation is available. Candidates may visit the Hospital by arrangement.

Apply to Group Secretary, Springfield Hospital, Tooting, S.W.17, for application forms, which should be returned, duly completed, on or before 31st May, 1958.

ST. GILES' HOSPITAL, Camberwell, S.E.5. Applications invited for appointment as SENIOR HOUSE OFFICER (casualty duties). Recognised for F.R.C.S. Vacant from 16th June or 1st July.

Apply, giving age, qualifications and previous post with copy testimonials or names of referees, to Group Secretary, Camberwell Hospital Management Committee, Dulwich Hospital, S.E.22, not later than 27th May.

ST. JAMES' HOSPITAL, Balham, S.W.12. Part-time CLINICAL ASSISTANT (E.N.T.) required for 1 session per week, either on Monday morning or Thursday afternoon. £183 15s. p.a.

Applications, stating age, qualifications, experience and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, at above address by 28th May.

ST. MARY'S HOSPITAL, Paddington, W.2. Diagnostic Radiological Department. POSTGRADUATE TRAINEESHIP, graded Senior House Officer, available from 1st October, 1958, for persons taking the D.M.R.D. course in London 1958–1960. Higher qualification advantageous. Appointment for 1 year, renewable for a second year.

Applications, giving full details, with names and addresses of 3 referees, should reach the House Governor not later than 28th May, 1958.

ST. MARY'S HOSPITAL, W.2. Outpatient Surgical ASSISTANT (part-time—graded Senior House Officer) for 2 notional half-days per week (Wednesday A.M., Friday P.M.) for a first period of 12 months as from a date to be arranged.

Applications, giving full details and names and addresses of 3 referees, should reach the House Governor not later than 4th June, 1958.

ST. MARY'S HOSPITAL, Paddington, W.2. Resident ANÆSTHETIST (Senior House Officer) for a first period of 6 months from 1st July, 1958.

Applications, giving full details, with names and addresses of 3 referees, should reach the House Governor not later than 28th May, 1958.

ST. MARY'S HOSPITAL, W.2. Registrar (part-time) to the E.N.T. Department for a first period of 12 months from 9th June, 1958, for 2 notional half-days per week (Monday A.M., Thursday A.M.).

Applications, giving full details and names and addresses of 3 referees, should reach the House Governor not later than 3rd June, 1958.

ST. THOMAS'S HOSPITAL and SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Joint appointment. Whole-time SENIOR REGISTRAR in Obstetrics and Gynæcology at Lambeth Hospital and St. Thomas's Hospital. The successful candidate will be required to take part in undergraduate teaching.

Applications (5 copies), including names and addresses of 3 referees, to the Clerk of the Governors, St. Thomas's Hospital, S.E.1, by 31st May, 1958.

ST. NICHOLAS HOSPITAL, Tewson-road, Plumstead, S.E.18. SENIOR HOUSE OFFICER (anæsthetics). Vacant 1st July. The post provides good experience and is recognised for F.F.A. R.C.S. and D.A. 6 months' resident appointment and may then be renewed.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ST. OLAVE'S HOSPITAL, Lower-road, Rotherhithe, S.E.16. BERMONDSEY AND SOUTHWARK GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER, Casualty Department, at above Hospital, which becomes vacant on 1st July, 1958. Resident or non-resident post, 9 A.M.–5 P.M. Salary £819 10s. p.a. Post recognised for F.R.C.S., is tenable for 6 months and is renewable.

Applications, together with full details and names of 2 referees, to the Secretary at above address, with 1 week of advertisement.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. Casualty OFFICER (with anæsthetic duties). Senior House Officer grade. Vacancy 1st July, 1958.

Applications, naming 2 referees, to Medical Superintendent within 14 days.

ST. TERESA'S MATERNITY HOSPITAL, The Downs, Wimbledon, S.W.20. (56 Beds.) Applications are invited from fully registered medical practitioners for the appointment of RESIDENT OBSTETRIC HOUSE OFFICER for 6 months in the first instance, commencing about 30th June. Salary £476 10s. to £819 10s. p.a. according to experience. Emoluments deducted according to usual scale. Self-contained flat available in the Hospital grounds. The appointment is recognised for the D.Obst.R.C.O.G.

Applications, stating age, qualifications, nationality and experience, and 2 recent testimonials, to the Medical Secretary by 16th June, 1958.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 6th September, 1958, for an ASSISTANT RESIDENT MEDICAL OFFICER (Senior House Officer) at the country branch hospital, Tadworth, Surrey (101 Beds).

Further particulars and form of application, which must be returned by 9th June, 1958, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be vacancies on 15th October, 1958, for the following Senior House Officers :

2 HOUSE PHYSICIANS.
1 HOUSE SURGEON.

Further particulars and form of application which must be returned not later than 9th June, 1958, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

TOTTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE. The Green, London, N.15. Applications are invited for the appointment of RESIDENT HOUSE PHYSICIAN (third post) for acute medical ward at St. Ann's General Hospital with some duties at The Prince of Wales's General Hospital for a period of 6 months from 31st May, 1958.

Application form from Secretary to be returned immediately.

WANDSWORTH HOSPITAL GROUP. South West METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (obstetrics and gynæcology) required for Group Maternity Unit. Post vacant 13th August. Recognised for M.R.C.O.G. Duties at St. James' Hospital and Weir Maternity Hospital.

Application forms, obtainable from Group Secretary, St. James' Hospital, Balham, S.W.12, to be completed and returned by 31st May.

WEST LONDON HOSPITAL, Hammersmith-road, Lon-don W.6. Whole-time NON-RESIDENT REGISTRAR (radio-diagnosis) required. Post vacant 11th June.

Detailed applications, names 2 referees, to Secretary, Board of Governors, The Hammersmith, West London and St. Mark's Hospitals, Ducane-road, London W.12, by 26th May.

WHITTINGTON HOSPITAL, London, N.19. Surgical REGISTRAR required for unit of 74 Beds consisting of general surgical beds with large gastroenterological section. F.R.C.S. essential. Vacant now. Hospital may be visited by appointment with the Medical Superintendent (ARChway 3070, extension 440).

Application forms obtainable from and returnable to Group Secretary, Archway Group Hospital Management Committee, 46, Cholmeley-park, N.6, by 27th May, 1958.

WHITTINGTON HOSPITAL, London, N.19. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics). Resident. Vacant 1st August, 1958. Post recognised for F.F.A. R.C.S.

Application forms obtainable from Group Secretary, 46, Cholmeley-park, London, N.6 (ARChway 3070, extension 527), and returnable to the Medical Superintendent, Whittington Hospital, London, N.19, by 27th May, 1958.

WILLESDEN GENERAL HOSPITAL, Harlesden-road, London, N.W.10. RESIDENT HOUSE SURGEON wanted 15th June, plus 14 days locum from 1st June. Pre-registration candidates eligible.

Applications by 21st May to Hospital Secretary.

WOOLWICH GROUP HOSPITAL MANAGEMENT COM-MITTEE. HOUSE SURGEONS, 5 posts vacant 1st July, 3 at Memorial Hospital, Woolwich, 2 at St. Nicholas Hospital, Plumstead. All appointments approved for pre-registration service and recognised for F.R.C.S.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

WOOLWICH GROUP HOSPITAL MANAGEMENT COM-MITTEE. HOUSE PHYSICIANS, 6 appointments vacant 1st July, 3 at St. Nicholas Hospital, Plumstead; 3 at Brook General Hospital, Woolwich. Posts approved for pre-registration service.

Applications to Group Secretary, Memorial Hospital, Woolwich, S.E.18, not later than 1st June, 1958.

ABERDARE GENERAL HOSPITAL, Aberdare. (102 Beds.) RESIDENT SENIOR HOUSE OFFICER. Duties include obstetrics, gynæcology, and paediatrics, also rota duties in the Casualty Department.

Apply, with full particulars and copies of 2 recent testimonials, to Group Secretary, Merthyr and Aberdare Hospital Management Committee, St. Tydfil's Hospital, Merthyr Tydfil.

ABERYSTWYTH, CARDIGANSHIRE. GENERAL HOS-PITAL. MID-WALES HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (surgical) required (resident). Post recognised for F.R.C.S. examination. Vacancy immediate.

Applications, stating age, experience, &c., to the Group Secretary, Mid-Wales Hospital Management Committee, 31, North-parade, Aberystwyth, Cardiganshire.

ASCOT. HEATHERWOOD ORTHOPÆDIC HOSPITAL. Locum SENIOR HOUSE OFFICER (orthopædics) required last 2 weeks in May.

Applications, giving full details and names of 2 referees, to Secretary.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE SURGEONS (2) for Traumatic and Orthopædic Unit. Posts vacant now. 6-month appointments, suitable for pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE SURGEON for general surgical duties. Post vacant 27th May, 1958. 6 months' appointment, suitable for pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

BARNSLEY CHEST SERVICE. Sheffield Regional HOSPITAL BOARD. Whole-time REGISTRAR (chest diseases) required. Single accommodation available at Wathwood Hospital. Duties at the Hospital and Barnsley Clinics under the supervision of the Consultant. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th May, 1958, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) SENIOR HOUSE OFFICER required, whose duties will be mainly casualty. The post is tenable for 1 year, and will be vacant in early June. Small furnished flat available.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BARNSTAPLE, NORTH DEVON INFIRMARY. (105 Beds.) HOUSE SURGEON (pre-registration) required from mid-July.

Applications, naming 2 referees, to Group Secretary, 19, Alexandra-road, Barnstaple, N. Devon.

BARROW-IN-FURNESS. NORTH LONSDALE HOS-PITAL. Applications are invited for the resident post of HOUSE OFFICER (surgical) (approved for pre-registration) at the North Lonsdale Hospital, Barrow-in-Furness. Post available immediately. Recognised for F.R.C.S.

Applications to the Group Secretary, Barrow and Furness Hospital Management Committee, 105, Abbey-road, Barrow-in-Furness.

BARRY ACCIDENT AND SURGICAL HOSPITAL. SENIOR HOUSE OFFICER required at above Hospital. Unfurnished house available to rent.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

BEBINGTON, WIRRAL, CHESHIRE. CLATTERBRIDGE HOSPITAL. CENTRAL WIRRAL GROUP. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (casualty/orthopædics) (resident or locum). Salary in accordance with current terms and conditions of service, i.e., £852 10s.–£55–£1182 10s. p.a., less £170 p.a. for residential facilities.

Application forms, obtainable from the Secretary, should be returned within 7 days of the appearance of this advertisement.

BEDFORD GENERAL HOSPITAL. (431 Beds.) 2 resident pre-registration HOUSE PHYSICIANS required end May.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEDFORD GENERAL HOSPITAL. (436 Beds.) Resi-DENT HOUSE SURGEON (gynæcology and obstetrics). Vacant 30th June. Post recognised for D.Obst.R.C.O.G. The Maternity Unit comprises 75 obstetric and 26 gynæcological beds, and the Hospital has a busy Outpatient Department.

Detailed applications, with copies of 2 recent testimonials, to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by 28th May.

BEDFORD GENERAL HOSPITAL. (431 Beds.) House SURGEON required. Pre- or post-registration; recognised for F.R.C.S. Vacant early June. Post offers exceptional opportunities for general experience in busy acute surgical units.

Inquiries and applications, with copies of 2 recent testimonials, to be sent immediately to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) HOUSE SURGEON (House Officer or Senior House Officer grade, according to experience). Vacant 1st June, 1958. General surgical duties, some orthopædics. Offers good opportunity for general experience in busy acute general hospital. Recognised for F.R.C.S. Approved pre-registration post but fully registered practitioners may apply.

Applications to Group Secretary, Westwood Hospital, Beverley, Yorkshire.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street, BIRMINGHAM, 3. HOUSE OFFICER (resident) required. Recognised for D.O. and F.R.C.S. in Ophthalmology. Wide experience available in all branches including surgery.

Detailed applications to the Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Birmingham (Selly Oak) Group, Oak Tree-lane, Birmingham, 29**

REGISTRAR (general surgery), 2 posts. Selly Oak Hospital, Birmingham, 29 (equipped beds 1033). Application made to R.C.S. for recognition. Experience in specialty essential. Higher qualification desirable. Resident non-resident.

(2) **West Bromwich Group, Edward-street, West Bromwich**

REGISTRAR (obstetrics and gynæcology). Duties mainly at Hallam Hospital, West Bromwich (430 Beds). Experience in specialty required. Resident.

(3) **Stoke-on-Trent Group, Princes-road, Stoke-on-Trent**

REGISTRAR (gynæcology and obstetrics) for North Staffordshire Royal Infirmary (455 Beds). Mainly gynæcology, with experience in abnormal obstetrics. Resident. Higher qualification desirable. Vacant shortly. Recognised M.R.C.O.G. (gynæcology).

Application forms from Group Secretaries, to be returned by 29th May, 1958.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the non-resident post of SENIOR HOUSE OFFICER or REGISTRAR in Pædiatrics—grading according to experience—for duties at the Birmingham Maternity Hospital, Loveday-street, and the Maternity Department of the Queen Elizabeth Hospital. Previous experience, resident, in a children's hospital is essential, and candidates should hold the D.C.H. or higher qualifications. Post vacant 1st August, 1958.

Applications, stating age, nationality, qualifications and previous appointments, should be forwarded to the House Governor, Birmingham and Midland Hospitals for Women, Showell Green-lane, Birmingham, 11, not later than 28th May, 1958.

BIRMINGHAM. UNITED BIRMINGHAM HOSPITALS, THE BIRMINGHAM AND MIDLAND HOSPITAL FOR WOMEN, Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. Applications are invited from registered medical practitioners for the post of RESIDENT GYNÆCOLOGICAL HOUSE SURGEON for duty with the Professorial Unit early in June, 1958. The appointment is recognised for the M.R.C.O.G.

Application forms obtainable from the House Governor at the above address, to be returned by 31st May, 1958.

BISHOP AUCKLAND. GENERAL HOSPITAL. House OFFICER (obstetrics and gynæcology). Applications invited from registered or pre-registration practitioners. Post vacant 1st July, 1958. Recognised for D.Obst.R.C.O.G. Departmental beds 69.

Apply, naming 2 referees, to Group Secretary, South West Durham Hospital Management Committee, at above address.

BISHOP AUCKLAND, CO. DURHAM. THE GENERAL HOSPITAL. (350 Beds.) HOUSE PHYSICIAN required. Fully registered or provisionally registered practitioner.

Apply, naming 2 referees, to K. G. T. LUXFORD, Group Secretary, South West Durham Hospital Management Committee, at the above address.

BISHOP'S STORTFORD, HERTFORDSHIRE. HERTS AND ESSEX GENERAL HOSPITAL. Applications invited for post of HOUSE OFFICER (surgical) (pre-registration). Salary £467 10s.–£522 10s. p.a. less £125 for residential emoluments. Appointment to commence immediately.

Applications, stating age, nationality, qualifications and experience with copies of 2 testimonials or names of referees, to Hospital Secretary.

BISHOP'S STORTFORD, HERTFORDSHIRE. HERTS AND ESSEX GENERAL HOSPITAL. (341 staffed beds.) Applications invited for appointment of SENIOR HOUSE OFFICER (medical) for special departments, giving experience in general and chest medicine, dermatology, pædiatrics, and physical medicine, and involving care of approximately 65 Beds in all. Salary £819 10s. p.a. less £150 p.a. in respect of residential emoluments. Appointment to commence 25th June, 1958, for period of 12 months.

Applications, stating qualifications, nationality, age and experience, with copies of testimonials or names of 2 referees, to Hospital Secretary, from whom further particulars of appointment can be obtained.

BOLTON DISTRICT GENERAL HOSPITAL. (607 Beds, including 107 for obstetrics and 30 for gynæcology.) BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.

RESIDENT SENIOR HOUSE OFFICER for Department of Obstetrics and Gynæcology. Vacant 8th July and tenable for 12 months. Recognised for M.R.C.O.G. and D.Obst.R.C.O.G.

RESIDENT HOUSE PHYSICIAN for Department of Pædiatrics. Not available to pre-registration candidates. Tenable for 6 months. Hospital recognised for D.C.H.

RESIDENT HOUSE SURGEON for general surgical duties. Now vacant, tenable for 6 months and recognised under pre-registration service scheme. Also recognised for the F.R.C.S.

Applications, stating age, nationality, qualifications, experience and the names of 2 referees, to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE SURGEON. The appointment which becomes vacant on 31st May, 1958, is recognised for the F.R.C.S. examination and for pre-registration purposes.

Applications to the Hospital Secretary.

BLACKBURN AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics) required middle of July, 1958, for duties throughout the Group, mainly at Royal Infirmary, Blackburn. Residence at Royal Infirmary, Blackburn. Post recognised for D.A. and F.F.A. R.C.S.

Apply to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn, giving names of 2 referees.

BLACKBURN AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. Fully registered HOUSE OFFICER (pædiatrics) required. Post recognised for D.C.H. Duties as laid down by Consultant Pædiatrician.

Applications, stating experience and giving names of 2 referees, to the Group Secretary, Hospital Management Committee, Royal Infirmary, Blackburn.

BLACKBURN. ROYAL INFIRMARY. (262 acute beds.) BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (general surgery) required 1st July, 1958, at the above Infirmary. Recognised for F.R.C.S.

Apply to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKBURN. ROYAL INFIRMARY. (262 general beds.) BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Locum JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER (Casualty and Orthopædics) required for 1 week commencing 28th May, 1958.

Inquiries to Group Secretary, Royal Infirmary, Blackburn. Telephone 7133.

BLACKBURN. ROYAL INFIRMARY. Blackburn and DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required 7th July, 1958. Recognised for F.R.C.S. and approved for pre-registration purposes.

Apply to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BRIGHTON GENERAL HOSPITAL. Applications are invited for the appointment of HOUSE PHYSICIAN to the Medical Unit. This is a pre-registration appointment. Salary in accordance with national scale.

Applications, enclosing recent testimonials, and stating age, qualifications, experience, and giving the names of 2 referees, should be sent to the Physician-Superintendent, Brighton General Hospital, Elm-grove, Brighton, 7.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (314 Beds.) CASUALTY HOUSE SURGEON required mid-June. Duties include work in Orthopædic and Traumatic Unit. Recognised for pre-registration and F.R.C.S.

Applications, stating age, qualifications, &c., and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (314 Beds.) HOUSE SURGEON required end May. Pre-registration and recognised for F.R.C.S.

Applications, stating usual particulars, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRISTOL. SOUTHMEAD GENERAL HOSPITAL GROUP MANAGEMENT COMMITTEE. Applications are invited for the following appointments which will become vacant on 1st August, 1958 :—

Southmead Hospital, Bristol (570 Beds including 138 maternity)

1 SENIOR HOUSE OFFICER (medical).

1 SENIOR HOUSE OFFICER (pathology), general experience in clinical pathology, including blood transfusion duties.

1 SENIOR HOUSE OFFICER (urology), post recognised for F.R.C.S.

2 SENIOR HOUSE OFFICERS (casualty) (1 will also have duties as Orthopædic House Surgeon and the other as E.N.T. House Surgeon), posts recognised for F.R.C.S. examination.

2 HOUSE OFFICERS (casualty) (1 will also have duties as Orthopædic House Surgeon and the other as E.N.T. House Surgeon), posts recognised for F.R.C.S. examination.

3 HOUSE SURGEONS, posts recognised for F.R.C.S. examination.

5 HOUSE PHYSICIANS.

1 HOUSE SURGEON (gynæcology), post recognised for M.R.C.O.G. examination.

2 HOUSE OFFICERS (obstetrics), posts recognised for M.R.C.O.G. examination.

2 HOUSE PHYSICIANS (pædiatrics), posts recognised for D.C.H.

Applications are also invited for 2 HOUSE OFFICERS (obstetrics) at Southmead Hospital for 6 months commencing 1st November, 1958; for a SENIOR HOUSE OFFICER (surgical) for 12 months commencing 1st September, 1958 (post recognised for F.R.C.S. examination), and for a SENIOR HOUSE OFFICER (pathology) for 12 months commencing 1st September, 1958.

Applications, on forms to be obtained from the undersigned, to be returned not later than the 9th June, 1958.

C. C. HANCOCK, Group Secretary.

Southmead Hospital, Bristol.

BRISTOL. COSSHAM AND FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. Applications invited for 2 posts of SENIOR HOUSE OFFICER in the Regional Department of Thoracic Surgery (100 Beds) at Frenchay Hospital. The posts provide experience in all branches of cardiac, œsophageal and pulmonary surgery and the appointments are recognised for the Fellowship examinations of the Royal College of Surgeons. 1 post vacant 1st July, 1 1st August.

Applications, stating age and experience and naming 2 referees, to the Group Secretary, Frenchay Hospital, Bristol.

BRADFORD ROYAL INFIRMARY, Bradford, Yorkshire. (507 Beds.) SENIOR HOUSE OFFICER (general surgery/urology) required. Post recognised for F.R.C.S.

Applications, stating age, qualifications, experience, and nationality, to the Secretary.

BRADFORD, 1. THE ROYAL EYE AND EAR HOSPITAL. SENIOR HOUSE SURGEON (ophthalmology) required. Post recognised for D.O.M.S. and F.R.C.S.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to the Secretary, Bradford Royal Infirmary.

BRADFORD. ST. LUKE'S HOSPITAL. (724 Beds.) HOUSE SURGEON (general surgery/plastic) required. Recognised for F.R.C.S. and pre-registration purposes.

Applications, stating age, qualifications, experience, and nationality, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD. ST. LUKE'S HOSPITAL. (724 Beds.) House PHYSICIAN (pædiatrics) required. Recognised for pre-registration purposes.

Applications, stating age, qualifications, experience and nationality, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BROMSGROVE GENERAL HOSPITAL, Worcestershire. (411 Beds.) Applications are invited for the pre-registration post of HOUSE PHYSICIAN at the above Hospital. Post vacant early July.

Applications, with the names of 3 referees, to the Hospital Secretary.

BROMSGROVE GENERAL HOSPITAL, Worcestershire. (411 Beds.) HOUSE OFFICER in Obstetrics and Gynæcology required. 38 maternity, 18 gynæcological beds. Post vacant early July. Recognised for D.Obst.R.C.O.G. and M.R.C.O.G.

Applications, with the names of 3 referees, to the Hospital Secretary.

BROMSGROVE GENERAL HOSPITAL, Worcestershire. (411 Beds.) Applications are invited for the pre-registration post of HOUSE SURGEON at the above Hospital. Post vacant early July.

Applications, with the names of 3 referees, to the Hospital Secretary.

BROMSGROVE, WORCESTERSHIRE. HILL TOP HOSPITAL. (76 Beds.) Regional Thoracic Surgical Centre. Applications are invited for the pre-registration post of HOUSE PHYSICIAN at the above Hospital. Post vacant early July.

Applications, with the names of 3 referees, to the Hospital Secretary, Bromsgrove General Hospital, Worcestershire.

BROMSGROVE, WORCESTERSHIRE. HILL TOP HOSPITAL. (76 Beds.) Regional Thoracic Surgical Centre. Applications are invited for the pre-registration post of HOUSE SURGEON at the above Hospital. Post vacant early July.

Applications, with the names of 3 referees, to the Hospital Secretary, Bromsgrove General Hospital, Bromsgrove, Worcestershire.

BURTON-ON-TRENT GENERAL HOSPITAL. Applications are invited for the following pre-registration appointments, which become vacant during June and July, 1958 :—

HOUSE SURGEONS (general).

HOUSE SURGEON (gynæcology and obstetrics).

Recognised for F.R.C.S.

Apply Group Secretary, The General Hospital, Burton-on-Trent.

BURTON-ON-TRENT. THE GENERAL HOSPITAL. HOUSE OFFICER (orthopædics) (pre-registration post) required at the above Hospital. Recognised for F.R.C.S.

Applications to Group Secretary as soon as possible.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER (pathology). Post vacant mid-May.

Apply, stating age, qualifications, experience, nationality, and names of 2 referees, to H. WILKINSON, Group Secretary, Bury General Hospital, Bury, Lancs.

BURY ST. EDMUNDS. WEST SUFFOLK GENERAL HOSPITAL. (262 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required for casualty duties. Salary £852 10s.–£55–£1182 10s. a year. A Senior House Officer is also employed.

Inquiries and applications to Hospital Secretary.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. Surgical REGISTRAR (non-resident) for 1 year in first instance from mid-June, renewable for second year.

Apply, with full particulars and names of 3 referees, to Secretary, United Cambridge Hospitals, by 27th May, 1958.

CAMBRIDGE. THE UNITED CAMBRIDGE HOS-PITALS. RESIDENT OBSTETRICAL OFFICERS (2) at Maternity Hospital, Mill-road, Cambridge, for 6 months from 1st July and 1st August, 1958, respectively. Second or subsequent post, recognised pre-registration service. Recognised for M.R.C.O.G. and D.Obst.R.C.O.G. examinations.

Apply, stating age, nationality, qualifications and experience with dates, and copies of 3 testimonials, to Secretary, United Cambridge Hospitals, Addenbrooke's Hospital, Cambridge, by 28th May. Interviews early June.

CAMBRIDGE. THE UNITED CAMBRIDGE HOS-PITALS. ADDENBROOKE'S HOSPITAL, CAMBRIDGE. GYNÆCOLOGICAL HOUSE SURGEON (House Officer or Senior House Officer grading) for 6 months from 1st August. Recognised for pre-registration service and M.R.C.O.G.

Apply to the Secretary by 28th May, stating age, nationality, qualifications and experience with dates, and with copies of 3 testimonials. Interviews early June.

CARDIFF. ROOKWOOD HOSPITAL. Senior House OFFICER (surgical) required at above Hospital.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. ST. DAVID'S HOSPITAL. Senior House OFFICER (resident) required immediately in Geriatric Unit (200 Beds) at above Hospital.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the appointment of MEDICAL REGISTRAR to the Miners' Chest Diseases Treatment Centre at Llandough Hospital, Penarth, Glam. The Centre caters for all types of chest diseases and it is closely associated with the adjoining Pneumoconiosis Research Unit of the Medical Research Council.

Application forms may be obtained from the Secretary to the Board at the Cardiff Royal Infirmary, Newport-road, Cardiff, and should be returned within 14 days of the appearance of this advertisement.

CANTERBURY. KENT AND CANTERBURY HOS-PITAL. (277 Beds.) The post of GENERAL SURGICAL AND UROLOGICAL HOUSE SURGEON (pre-registration or third post), which is recognised for the F.R.C.S., is now vacant. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOS-PITAL. (277 Beds.) The post of SENIOR HOUSE PHYSICIAN is now vacant at Stodmarsh Road Annexe. Duties include care of 30-Bedded unit of chest diseases, also work at the Chest Clinic and with the Pneumoconiosis Unit. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARLUKE, LANARKSHIRE. LAW HOSPITAL. (790 Beds.) Applications are invited for the post of Locum ANÆSTHETIST (Senior House Officer or Junior Hospital Medical Officer grading) for June, July, and August.

Applications, stating age, qualifications and previous experience, together with the names of 2 referees, should be submitted to the Group Medical Superintendent as soon as possible.

CHELMSFORD AND ESSEX HOSPITAL. (161 Beds.) Applications are invited for the post of RESIDENT HOUSE PHYSICIAN, pre-registration post, to work in the general medical wards of the Hospital. Duties will commence on 14th June.

Applications, together with 2 recent testimonials, to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. Locum REGISTRAR in Obstetrics and Gynæcology required for the period 9th June until 22nd June, 1958, inclusive.

Applications, with full particulars, to the Group Secretary, Chelmsford Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. House SURGEON (pre-registration, first or second post). To commence 1st June, 1958. The Hospital deals with a large number of routine and emergency cases. Recognised for training for the Fellowship of the Royal College of Surgeons.

Applications, stating age, nationality, qualifications and experience, together with copies of recent testimonials, should be received not later than 20th May by the Secretary, Hospital Management Committee, Chelmsford Group, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. House PHYSICIAN (pre-registration, first, second or third appointment), Male or Female. To commence 1st June, 1958.

Applications, stating age, nationality, qualifications and experience, together with copies of recent testimonials, should be received not later than 20th May by the Secretary, Hospital Management Committee, Chelmsford Group, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. Resident SURGICAL OFFICER (Senior House Officer grade). Duties to commence 7th June, 1958. The appointment is recognised for training for the Fellowship of the Royal College of Surgeons.

Applications, stating age, nationality, qualifications and experience, together with copies of recent testimonials, to be received not later than 27th May, by the Secretary, Hospital Management Committee, Chelmsford Group, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. Applications are invited from registered practitioners for the post of RESIDENT PÆDIATRIC HOUSE OFFICER (Male or Female), commencing as soon as possible. To work in the Pædiatric Unit of the Chelmsford Hospital Group. The Unit includes a Premature Baby Nursery of 10 Cots, and a Neonatal Department in the maternity block of the Hospital. The Department is recognised for the D.C.H.

Applications, stating age, nationality, qualifications and experience, together with recent testimonials, should be forwarded immediately to the Group Secretary, Chelmsford Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHESTERFIELD. SCARSDALE HOSPITAL. (72-Bed maternity unit.) SENIOR HOUSE OFFICER (obstetrics and gynæcology) required 1st July at above Hospital. Post recognised for M.R.C.O.G. and D.Obst.R.C.O.G. purposes. National salary and conditions.

Please apply M. H. BOONE, Group Secretary, Chesterfield Hospital Management Committee, at Chesterfield Royal Hospital.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. CHICHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. RESIDENT MEDICAL REGISTRAR required 1st August for duty primarily at this Hospital (202 Beds) with care, under Consultant Physicians, of 60 adult medical, and 10 children's beds ; also assisting Dermatologist. Whitley Council terms and National Health Service superannuation. Salary £935 first year, £1061 10s. second year, less £170 for residence. Candidates may visit Hospital.

Forms from Group Secretary, 174, Broyle-road, Chichester, to be submitted within 14 days.

CHICHESTER. ST. RICHARD'S HOSPITAL. Chichester GROUP HOSPITAL MANAGEMENT COMMITTEE, SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. RESIDENT SURGICAL REGISTRAR required 1st August for duty primarily at this Hospital (400 Beds), for 1 year in first instance. Hospital recognised for F.R.C.S. Whitley Council terms and National Health Service superannuation. Salary £935 first year, £106 10s. second year, less £170 for residence.

Forms from, and returnable within 14 days to, Group Secretary, 174, Broyle-road, Chichester.

CHELTENHAM GENERAL HOSPITAL. (220 Beds.) HOUSE SURGEON required (pre- or post-registration). The post offers a wide experience in general surgery, gynæcology, and orthopædic surgery. Post recognised for the F.R.C.S.

Apply, with names of 2 referees, to the Secretary, General Hospital, Cheltenham.

CHELTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from Male and Female practitioners for the appointment of SENIOR HOUSE OFFICER ANÆSTHETIST which will be vacant in September, 1958. Salary and conditions of service in accordance with Whitley Council regulations.

Applications, with names of referees and full details, to S. T. DAVIS, Group Secretary, General Hospital, Cheltenham.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for:—

Black Notley Hospital, Braintree, Essex (522 Beds)

Post of HOUSE OFFICER (orthopædic surgery). Duties include care of cases from London Hospital Orthopædic Department. Pre-registration or third post, tenable for 6 months. Recognised for F.R.C.S.

Clacton and District Hospital, Clacton-on-Sea, Essex (58 Beds)

Post of SENIOR HOUSE OFFICER. Duties include medical, surgical, and casualty work. Post tenable for 6 months or 1 year.

Post of REGISTRAR (temporary) as Resident Casualty Officer during summer for period not exceeding 6 months.

Essex County Hospital, Colchester, Essex (181 Beds)

Post of HOUSE OFFICER to E.N.T. and Pædiatric Departments. Post tenable for 6 months. Post-registration appointment. Recognised for D.L.O. The Pædiatric Department consists of a new unit of 24 Beds.

Post of Locum SENIOR HOUSE OFFICER (anæsthetics) required from 20th May for approximately 2 months.

Post of Locum SENIOR HOUSE OFFICER to Casualty and E.N.T. Departments. Required immediately for 2 or 3 weeks.

Applications, with copies of 3 testimonials to Group Secretary, Colchester Group Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

CREWE AND DISTRICT MEMORIAL HOSPITAL. (140 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (surgical), which is recognised by the Royal College of Surgeons for the F.R.C.S. examination. Now vacant. This Hospital has recently had a new twin theatre suite and a new large Casualty Department added. There are 7 residents, and ample opportunity for gaining experience in operative surgery will be afforded to the right candidate. Salary and conditions in accordance with Whitley Council scale.

Applications, stating age, qualifications, &c., with names of 2 referees, to be sent to the Group Secretary, Barony Hospital, Nantwich, Cheshire, within 10 days after publication.

CUCKFIELD HOSPITAL, Cuckfield, near Haywards HEATH, SUSSEX. MID-SUSSEX HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (general surgery). Post, recognised for Fellowship, now vacant. Tenable 6 months in the first instance.

Applications, stating age, qualifications, nationality and experience, with names of 2 referees, to Hospital Secretary.

CUCKFIELD HOSPITAL, Cuckfield, near Haywards HEATH. MID-SUSSEX HOSPITAL MANAGEMENT COMMITTEE. Locum RESIDENT SENIOR HOUSE OFFICER (general surgery) required.

Applications, with names of 2 referees, to Hospital Secretary.

CUCKFIELD HOSPITAL, Cuckfield, near Haywards HEATH. MID-SUSSEX HOSPITAL MANAGEMENT COMMITTEE. RESIDENT JUNIOR HOUSE SURGEON (general surgery). Pre-registration post now vacant. Tenable 6 months. Health Service conditions.

Applications, stating age, nationality and experience, with names of 2 referees, to Hospital Secretary.

CUCKFIELD HOSPITAL, Cuckfield, near Haywards HEATH. MID-SUSSEX HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (Orthopædic and Traumatic Unit). Post, recognised for fellowship, vacant 1st August. Tenable 6 months in first instance.

Apply, stating age, qualifications, nationality and experience, with names of 2 referees, to Hospital Secretary.

CUCKFIELD HOSPITAL, Cuckfield, near Haywards HEATH. MID-SUSSEX HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOUSE SURGEON (Orthopædic and Traumatic Unit). Post vacant end of May. Not pre-registration.

Applications, giving age, nationality, qualifications and experience, with names of 2 referees, to Hospital Secretary.

DONCASTER ROYAL INFIRMARY. (Recognised under the regulations for the Fellowship and D.L.O.) Applications are invited for the post of SENIOR HOUSE OFFICER in the E.N.T. Department. Post vacant late June.

Applications to the Group Secretary, Doncaster Hospital Management Committee, at Doncaster Royal Infirmary.

DRIFFIELD, YORKSHIRE. EAST RIDING GENERAL HOSPITAL. (247 Beds.) JUNIOR HOUSE PHYSICIAN, vacant now. Approved pre-registration post, but fully registered practitioners may apply. Duties to include geriatrics and acute medicine. Good general experience for first house appointment.

Apply Group Secretary, Westwood Hospital, Beverley, Yorkshire.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botleys Park War Hospital). (430 Beds.) ORTHOPÆDIC HOUSE SURGEON (Senior House Officer or House Officer (intern) grade). 100 orthopædic beds. Post recognised for F.R.C.S. and pre-registration service. Salary in accordance with terms and conditions of National Health Service. Post vacant 28th May, 1958.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, Chertsey, Surrey.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (647 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time, NON-RESIDENT REGISTRAR in General and Genitourinary Surgery required at above Hospital, which may be visited by direct appointment with Medical Administrator.

Application forms obtainable from and returnable to Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, Edgware, Middlesex, by 24th May, 1958.

ELLESMERE PORT HOSPITAL. Applications are invited for the appointment of RESIDENT SURGICAL OFFICER (Junior Hospital Medical Officer grade). This is an acute hospital (39 Beds) at which regular Consultant outpatient and operating sessions are held. The accommodation available is suitable for either a single or a married practitioner.

Applications, giving full details of qualifications and experience, should be forwarded to the Group Secretary, Chester and District Hospital Management Committee, 5, King's-buildings, Chester.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. RESIDENT ORTHOPÆDIC HOUSE SURGEON (third post). Vacant immediately. Post also provides opportunity for general surgery. 6 months' appointment. Post recognised for F.R.C.S.

Applications, with the names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, at Chase Farm Hospital.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. RESIDENT HOUSE PHYSICIAN, approved pre-registration. Vacant 12th July, 1958. General medical duties. 6 months' appointment.

Applications, with the names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, at Chase Farm Hospital.

ENFIELD. WAR MEMORIAL HOSPITAL, Chase Side, ENFIELD, MIDDLESEX. RESIDENT SENIOR HOUSE OFFICER required immediately for general medical and surgical duties in acute general hospital of 61 Beds. 12 months' appointment.

Applications, with names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, Chase Farm Hospital, The Ridgeway, Enfield, Middlesex.

EPPING. ST. MARGARET'S HOSPITAL. Senior House OFFICER (anæsthetics). Resident. Post now vacant. Busy general hospital. Easy access to London. Good experience. Recognised for D.A.

Applications, with copies of recent testimonials, to be sent immediately to the Group Secretary, Epping Group Hospital Management Committee, Oak Cottage, The Plain, Epping, Essex.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE PHYSICIAN required 8th June. Fully registered post. Duties at above Hospital and Annexes include general medicine, geriatrics, pædiatrics, and dermatology.

Applications, stating age, qualifications and experience, with copies of 2 recent testimonials, should be sent as soon as possible to Group Secretary, at above address.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE SURGEON required 11th June, pre-registration post recognised for F.R.C.S.

Applications, stating age, qualifications and experience, with copies of 2 recent testimonials, should be sent as soon as possible to Group Secretary at above address.

FARNBOROUGH HOSPITAL, Kent. (800 Beds.) House SURGEON (general surgery) required 1st June. Suitable for pre-registration or registered candidate. Recognised for F.R.C.S.(Eng.). (There are 140 surgical beds and a resident medical staff of 15 including 3 House Surgeons.)

Apply, stating age, qualifications with dates, and experience and naming 3 referees, to Administrative Officer immediately, quoting H.S.

GRAVESEND AND NORTH KENT HOSPITAL, Graves-END, KENT. MEDWAY AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON. Applications are invited for this resident post (1 of 5 at the Hospital) which is approved for pre-registration purposes and recognised for the F.R.C.S. The successful applicant will be attached to 2 Consultant Surgeons with opportunities for extensive surgery and vascular work. Salary £467 10s.–£577 10s. p.a. according to experience.

Applications to Hospital Secretary, stating age, experience, qualifications, and nationality.

GREENFORD. PERIVALE MATERNITY HOSPITAL. HOUSE OFFICER. Vacant 1st June. Post recognised for Diploma in Obstetrics. Preference given to person seeking second pre-registration post under the Medical Act, 1950.

Applications, stating age, nationality, qualifications with dates and experience, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, Middlesex, by 23rd May, 1958.

GRIMSBY. SPRINGFIELD HOSPITAL. (202 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (chest and infectious diseases) required. House available. There is a Thoracic Unit at the Hospital. Some clinic work would be undertaken under Consultant supervision. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th May, 1958, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

GLASGOW. NORTHERN HOSPITALS AND ASSOCIATED CHEST CLINICS. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (pulmonary tuberculosis) in the above Hospitals. There are ample opportunities for the study of all forms of chest disease and general medical cases.

Applications, stating age, qualifications and experience, with the names of 2 referees, to be sent to the Secretary of the Board of Management for Glasgow Northern Hospitals, 13, Woodside-place, Glasgow, C.3.

GLASGOW. ROYAL HOSPITAL FOR SICK CHILDREN, YORKHILL, GLASGOW, C.3. Vacancies exist for RESIDENT HOUSE OFFICERS in Pædiatric Surgery at the above Hospital, for the term 1st August, 1958–31st January, 1959.

Applications to Medical Superintendent.

GLASGOW, N.W. RUCHILL HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in the Infectious Diseases Department (450 Beds.) Excellent experience in infectious diseases and general medicine. Undergraduate and postgraduate teaching unit and regional centre for treatment of poliomyelitis.

Applications, stating age, nationality, qualifications and experience, with names of 2 referees, to Physician-Superintendent.

GLASGOW, N.W. RUCHILL HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in the Chest Department (medical unit). The department consists of 200 Beds for the treatment of pulmonary tuberculosis and other diseases of the chest. There is attached to the department a Thoracic Surgical Unit of 60 Beds. Facilities are available for postgraduate study and research.

Applications, stating age, nationality, qualifications and experience, with names of 2 referees, to Physician-Superintendent.

HALIFAX AREA HOSPITALS MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER wanted for duties in the wards for chest cases at the Northowram Hall Hospital, Halifax, and the Outpatient Chest Clinic at the Royal Halifax Infirmary. Approximately 20 non-tuberculous chest patients in hospital and 75 tuberculous. Self-contained flat in good residential accommodation at the Hospital. Vacant end of June.

Applications to be forwarded to the Group Secretary at Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. House OFFICER (pre-registration) required for E.N.T. and Eye Departments at the above Infirmary. Post vacant 14th May.

Applications to the Group Secretary, Royal Halifax Infirmary, Halifax.

HARROGATE GENERAL HOSPITAL. (253 Beds.) Immediate vacancy for Pre-registration HOUSE SURGEON.

Applications, with names and addresses of 2 referees, to Hospital Secretary.

HASTINGS GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum NON-RESIDENT MEDICAL OFFICER required. Post vacant now. Salary £19 5s. per week.

Apply, with full details of experience, with copies of 3 references or the names of 3 referees, to Group Secretary, 11, Holmesdale-gardens, Hastings.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) HOUSE SURGEON. Pre-registration post for general surgery and urology required at this acute hospital (surgical) on 1st June, 1958.

Applications, with names of 2 referees, to Administrator.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for the appointment of HOUSE SURGEON (general, first or second post) to commence 1st June, 1958. Pre-registration post; recognised under F.R.C.S. regulations.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HEXHAM GENERAL HOSPITAL. (304 Beds.) Applications are invited for the following House appointments, vacant 7th July, 1958. Pre- or post-registration vacancies. Applications will be considered from final-year students in anticipation of graduation and also from registered practitioners.

HOUSE PHYSICIAN.

HOUSE SURGEONS (3) (general, combined with orthopædics).

Hospital recognised by R.C.S. Large orthopædic unit providing excellent experience.

Applications, with names of 2 referees, to Group Secretary, General Hospital, Hexham, Northumberland.

HILLINGDON HOSPITAL, Uxbridge, Middlesex. (621 Beds.) HOUSE SURGEON in General and Urological Surgery. Post recognised for F.R.C.S. and for pre-registration service.

Apply, together with copies of 3 recent testimonials, to Medical Director by 26th May.

HITCHIN, HERTFORDSHIRE. LISTER HOSPITAL. RESIDENT HOUSE PHYSICIAN required 12th June. Recognised as pre-registration post.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Administrator, Lister Hospital.

HOUNSLOW HOSPITAL, Staines-road, Hounslow, MIDDLESEX. (General acute—81 Beds.) Applications are invited for the appointment of RESIDENT HOUSE SURGEON. Recognised pre-registration appointment for 6 months. Vacant 14th May, 1958.

Applications, stating qualifications and age, together with copies of 3 recent testimonials or names for reference, to the Hospital Secretary.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. (115 Beds.) HOUSE SURGEON required on 1st August, 1958. Pre-registration or registration post. Recognised for D.C.H. An interesting and varied post which includes outpatient and casualty work.

Applications, together with details of experience, testimonials, &c., to the Hospital Secretary.

HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN—Pædiatric Unit. Duties at Victoria Children's Hospital for 3 months followed by 3 months on the pædiatric wards, Western General Hospital. An interesting and varied post which includes outpatient and casualty work. This appointment, which commences on 1st August, 1958, is recognised for the D.C.H.

Apply, giving experience, testimonials, &c., to the Secretary, Victoria Hospital for Sick Children, Park-street, Hull.

HULL. KINGSTON GENERAL HOSPITAL. (419 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (pre-registration post). Resident, and tenable for 6 months. This post includes gynæcology and general surgery.

Applications, with 2 recent testimonials, to the Hospital Secretary.

HUDDERSFIELD. ST. LUKE'S HOSPITAL. (235 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT MEDICAL OFFICER (Senior House Officer grade) at the above Hospital, to commence on 1st June, 1958. The Hospital caters for chronic sick, children, maternity, and acute medical and surgical patients. Salary in accordance with the terms and conditions of service for hospital medical and dental staff, £819 10s. p.a.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Group Secretary,
Huddersfield Hospital Management Committee.

The Royal Infirmary, Huddersfield.

IPSWICH AND EAST SUFFOLK HOSPITAL (Anglesea-ROAD WING). (350 Beds.) Applications invited for approved pre-registration post of HOUSE PHYSICIAN, vacant on 2nd June, 1958.

Applications, stating age, nationality and experience, together with copies of 3 recent testimonials, to Hospital Secretary as soon as possible.

IPSWICH AND EAST SUFFOLK HOSPITAL (Heath-ROAD WING), IPSWICH. Pre-registration post of HOUSE SURGEON to General Surgeon now vacant. Recognised for R.C.S. examination.

Detailed applications, with copies of recent testimonials, to Hospital Secretary.

IPSWICH. ST. HELEN'S HOSPITAL. (129 Beds for infectious diseases, pulmonary tuberculosis, long-stay orthopædics and geriatrics. The area Chest Clinic is in the Hospital.) HOUSE PHYSICIAN required (post-registration appointment). Accommodation available for married man.

Applications to JOHN WILLIAMS, Group Secretary, Ipswich Group Hospital Management Committee, at the Ipswich and East Suffolk Hospital (Anglesea-road Wing), Ipswich.

KEIGHLEY AND DISTRICT VICTORIA HOSPITAL, KEIGHLEY, YORKSHIRE. (General—139 Beds.) 2 RESIDENT HOUSE SURGEONS (either sex).

General surgery and E.N.T., vacant 1st July.

General surgery and orthopædics, vacant 10th June.

Both recognised for F.R.C.S. and approved pre-registration appointments, tenable for 6 months in first instance. 4 residents on staff.

Applications, with full particulars as to age, nationality and qualifications, and copies of 2 testimonials, to Group Secretary, Hospital Management Committee, 17, St. John's Hospital, Fell-lane, Keighley.

KETTERING AND DISTRICT GENERAL HOSPITAL, NORTHAMPTONSHIRE. Applications are invited for the post of Locum HOUSE SURGEON (pre-registration), for the month of May. Post recognised for F.R.C.S.

Applications, stating age, experience, and qualifications, together with copies of 3 recent testimonials, to be sent to the Group Secretary at the above address.

KETTERING AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. Applications are invited for the post of HOUSE PHYSICIAN (pre-registration), vacant 1st June, 1958.

Applications, stating age, experience and qualifications, together with 3 recent testimonials, to be sent to the Group Secretary, General Hospital, Kettering.

LENNOXTOWN, STIRLINGSHIRE. LENNOX CASTLE MATERNITY HOSPITAL. Applications are invited from suitably qualified medical practitioners for the appointment of RESIDENT SENIOR HOUSE OFFICER in Obstetrics and Gynæcology at the above Hospital (130 Beds). The appointment will be for 6 months in the first instance and will be subject to the National Health Service (Scotland) (superannuation) regulations.

Applications (2 copies), stating age, qualifications and experience, present appointment and giving names of 3 referees, to be submitted to the Secretary, Board of Management, Lennox Castle, 113, Douglas-street, Glasgow, C.2.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

Anæsthetics

(1) Duties in Leeds A and B Groups. Recognised for F.F.A. R.C.S. and D.A. Resident or non-resident.

(2) Huddersfield Group (approximately 225 Beds in the surgical specialties). Non-resident.

Infectious Diseases

Castle Hill Hospital, Cottingham (167 infectious diseases beds). Resident.

General Surgery

Huddersfield Group (100 general surgical beds). Residential accommodation available. Duties mainly at Huddersfield Royal Infirmary. Recognised for F.R.C.S. May include some duties in the Casualty Department.

Ophthalmology

St. James's Hospital, Leeds (31 eye beds—7600 new outpatients annually), and the Public Dispensary, Leeds. Non-resident.

Applications, stating age, qualifications and details of present and previous appointments, with dates, together with the names and addresses of 3 referees, to the Secretary, The Joint Registrars Committee, Park-parade, Harrogate, by 21st May, 1958.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

General/Orthopædic Surgery

For duties in the Halifax Group. 1 of 3 similar posts. Duties divided between general and orthopædic surgery (180 general surgical and 81 orthopædic surgery beds). May include some duties in the Casualty Department. Preferably resident.

Obstetrics and Gynæcology

Hull A and East Riding Groups (117 gynæcological and 144 obstetrical beds). Preferably resident. This post is 1 of 3 Registrar posts in obstetrics and gynæcology in the Hull area, and duties will rotate between :—

(*a*) Hull Royal Infirmary, Sutton (Gynæcological Unit).
(*b*) Hull Maternity Hospital (duties mainly obstetrical), and
(*c*) Western General Hospital, Kingston General Hospital (duties mainly gynæcological) and occasional duties at hospitals in the East Riding Group.

Psychiatry

Storthes Hall Hospital, Huddersfield (2750 Beds). Facilities for attendance at the Leeds University will be provided if the successful candidate is studying for the D.P.M.

Applications, stating age, qualifications and details of present and previous appointments, with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 28th May, 1958.

LANCASTER. BEAUMONT HOSPITAL, Slyne-road. PÆDIATRIC REGISTRAR (resident). Experience essential of all practical pædiatric techniques (blood-transfusion, &c.). Duties include experience in children's medical ward, in neonatal unit, and pædiatric outpatient clinics. Unit recognised for D.C.H. Candidates may visit Hospital by direct appointment.

Applications, together with names of 2 referees, to Group Secretary, Royal Lancaster Infirmary, Lancaster.

LANCASTER. ROYAL LANCASTER INFIRMARY. (240 Beds.) RESIDENT HOUSE OFFICER (surgical) (pre-registration post). Successful applicant will work with Consultant Surgical Unit and attend Consultative Clinics. Post tenable for 6 months. Recognised for F.R.C.S.

Applications, with names of 2 referees, to the Secretary, Royal Lancaster Infirmary, Lancaster.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (211 Beds.) HOUSE PHYSICIAN. Vacancy suitable for fully registered or pre-registration applicant. Post vacant 16th June, 1958.

Applications, with copies of 2 recent testimonials, to be sent to Hospital Secretary.

LINCOLN. COUNTY HOSPITAL. (200 Beds.) Applications are invited for the post of RESIDENT HOUSE SURGEON, Male or Female. This is an approved pre-registration post, the duties of which are with the general surgeon. If satisfactory this post will be followed by an appointment for a second 6 months as House Physician.

Applications, with copy testimonials, should be forwarded to the Group Secretary as soon as possible.

LINCOLN. ST. GEORGE'S HOSPITAL. (242 Beds.) LINCOLN NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE PHYSICIAN at the above Hospital, vacant from 1st May. Duties include acute medical, acute chest and pædiatrics.

Applications, giving full particulars and names for reference, should be addressed to the Secretary.

LLWYNYPIA HOSPITAL, Llwynypia, Rhondda. Pontypridd AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (medicine) required immediately. The person appointed will be required to undertake duties at the Llwynypia Hospital (40 acute medical beds and 78 chronic sick beds), Glyncornel Hospital (56 chronic sick beds), and Tyntyla Isolation Hospital (42 Beds).

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent immediately to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

LIVERPOOL, 9. AINTREE HOSPITAL. Fazakerley GROUP OF HOSPITALS MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (medical). Applications are invited from registered medical practitioners. The Hospital is for the treatment of pulmonary and non-pulmonary tuberculosis and is a main centre for thoracic surgery and has an Orthopædic Department. Salary will be in accordance with the terms and conditions of service for hospital medical staff.

Applications endorsed "Resident Senior House Officer" to be submitted immediately to the Physician-Superintendent.

LIVERPOOL, 9. AINTREE HOSPITAL. Fazakerley GROUP OF HOSPITALS MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Anæsthesia. Applications are invited from registered medical practitioners. The Hospital is for the treatment of pulmonary and non-pulmonary tuberculosis and is a main centre for thoracic surgery and has an Orthopædic Department. Salary will be in accordance with terms and conditions of service for hospital medical staff.

Applications endorsed "Senior House Officer in Anæsthesia" to be submitted immediately to the Physician-Superintendent.

LIVERPOOL, 9. FAZAKERLEY HOSPITAL. Senior HOUSE OFFICERS (resident), 2 vacancies; required after the end of June, 1958. The Hospital is the teaching centre for infectious diseases of the University of Liverpool. Facilities will be given for attending full-time course of Liverpool Diploma in Public Health.

Applications to Physician-Superintendent by 23rd May.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. LIVERPOOL ROYAL INFIRMARY. Applications are invited for temporary appointment to the resident post of JUNIOR CASUALTY OFFICER (Senior House Officer grade) for the period to 30th September, 1958.

Apply by 31st May, 1958, on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. THE WOMEN'S HOSPITAL. Applications are invited for a post of REGISTRAR in Pathology for the period to 30th September, 1959. The person appointed will be eligible for annual reappointment thereafter until completion of the normal period of training. This post can offer useful experience for persons with gynæcological experience, and the Board of Governors is willing to consider applications not only from those who are making a career in pathology but also from those with gynæcological training who wish to hold the post for only 1 year to obtain a knowledge of gynæcological pathology.

Apply by 24th May on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

MANCHESTER. BOOTH HALL CHILDREN'S HOSPITAL, BLACKLEY, MANCHESTER, 9. (380 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (resident) required for plastic unit and regional burns unit (45 Beds for severe burns and scalds). Post vacant 26th May. £170 deducted for full emoluments.

Applications, giving names and addresses of 2 referees, to be sent to Group Secretary, from whom further particulars may be obtained.

MANCHESTER. BOOTH HALL CHILDREN'S HOSPITAL, BLACKLEY, MANCHESTER, 9. (380 Beds. Recognised for D.C.H.) RESIDENT SENIOR HOUSE OFFICER (surgical). Duties orthopædic and E.N.T. Post vacant 1st August.

Applications, giving names and addresses of 2 referees, to be sent to Group Secretary, from whom further particulars may be obtained.

MANCHESTER REGIONAL HOSPITAL BOARD. Locum ANÆSTHETIC REGISTRAR required for duties mainly in the Stockport and Buxton Group with some duties in the Macclesfield Group of hospitals.

Applications to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Anæsthetics to the Blackpool and Fylde Group of hospitals.

Apply, stating age, qualifications and experience and giving the names and addresses of 2 referees, to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

MANCHESTER REGIONAL HOSPITAL BOARD. Bolton DISTRICT GENERAL HOSPITAL (607 Beds, including 107 for obstetrics and 30 for gynæcology). RESIDENT REGISTRAR in Obstetrics and Gynæcology. Recognised for M.R.C.O.G. and D.Obst.R.C.O.G.

Applications, stating age, nationality, qualifications, experience and the names of 2 referees, to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Anæsthetics. The main duties will be with the Stockport and Buxton Hospital Management Committee with some duties in the Macclesfield and District Hospital Management Committee Group. The post is recognised for the D.A. and F.F.A. R.C.S., and would suit a candidate wishing to study for higher qualification.

Applications, stating age, qualifications, and experience, together with the names of 2 referees, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Orthopædic Surgery to the Blackpool and Fylde Group of hospitals, with main duties at Victoria Hospital, Blackpool. There are 65 orthopædic beds in the groups and busy outpatient clinics. Ample scope for gaining experience in all aspects of the work of the department. Post recognised for F.R.C.S. examination and vacant from 1st June, 1958. A furnished flat is available in the married quarters situated in a detached property in a select residential area adjacent to the Hospital.

Applications, stating age, qualifications, experience and the names and addresses of 3 referees, should be sent to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of RESIDENT REGISTRAR in Obstetrics and Gynæcology. The duties will be with the Stockport and Buxton Hospital Management Committee, mainly at Stepping Hill Hospital and Stockport Infirmary, where there are 72 obstetric and 51 gynæcological beds. The post is recognised for M.R.C.O.G. and is vacant 26th May, 1958.

Applications, stating age, experience and qualifications, together with the names of 2 referees, to be addressed to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

MANCHESTER REGIONAL HOSPITAL BOARD. North AND MID-CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR (chest diseases) required to carry out duties arranged by the Consultant Chest Physician at the Altrincham, Northwich, Crewe Clinics, and the Grange Hospital, Weaverham, and such other duties as may arise at any hospital within the North and Mid and South Cheshire Groups.

Applications, together with 2 recent testimonials, should be sent to the Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

MANCHESTER REGIONAL HOSPITAL BOARD AND UNITED MANCHESTER HOSPITALS. SENIOR REGISTRAR in Surgery in the South Manchester Group of hospitals, mainly at Withington Hospital. The post is included in the regional rotation scheme and it is expected that the person appointed will later transfer to the Manchester Royal Infirmary.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 2nd June, 1958.

MANCHESTER REGIONAL HOSPITAL BOARD. Royal INFIRMARY AND QUEEN'S PARK HOSPITAL, BLACKBURN. REGISTRAR, Department of Psychological Medicine. Opportunity for wide experience in the treatment of inpatients and outpatients in general hospitals (including psychiatric inpatients in general medical wards) under direction of Consultant Psychiatrist. Modern, self-contained flat available suitable for married man. Recognised for D.P.M. by Conjoint Board and Manchester University. Facilities for attending D.P.M. course, Manchester University, and studying for higher qualifications. Services of Social Worker and Mental Health Workers.

Application forms from Group Secretary, Royal Infirmary, Blackburn, returnable by 1st June, 1958.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of REGISTRAR in General Surgery (recognised for F.R.C.S.(Eng.) in the Ashton, Hyde and Glossop Group of hospitals. Vacant 1st July, 1958.

Applications, stating age, nationality, qualifications and experience with copies of 2 references, should be forwarded to the Group Secretary, Ashton-under-Lyne General Hospital, Ashton-under-Lyne, Lancashire, as soon as possible.

MANCHESTER REGIONAL HOSPITAL BOARD. Salford HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR ANÆSTHETIST required to commence duty in July, Salford Group of hospitals, resident at Salford Royal Hospital with duties at Royal Manchester Children's Hospital. In addition to training in anæsthesia for general surgery, both adult and children, special facilities are available for gaining experience in neurosurgery and other surgical specialties. Post recognised for F.F.A. R.C.S., and encouragement will be given to the successful candidate to work for this examination.

Applications, together with copies of 2 recent testimonials, to Group Secretary, Salford Royal Hospital, Salford, 3, before 24th May, 1958.

MANCHESTER AND SALFORD HOSPITAL FOR SKIN DISEASES, Quay-street, MANCHESTER, 3. SALFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (resident). The appointment is for a period of 12 months commencing July.

Applications, stating age, qualifications with dates, nationality, and accompanied by copies of 2 recent testimonials, to be sent immediately to the Hospital Secretary.

MANCHESTER, 19. THE DUCHESS OF YORK HOS-PITAL FOR BABIES. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. There will be a vacancy at the above Hospital, which is associated with the Manchester University for teaching purposes, for a RESIDENT HOUSE OFFICER, Male or Female, post- or second pre-registration, for 6 months commencing 1st September, 1958.

Applications, with copies of 3 testimonials, to be sent immediately to the Administrative Officer at the above address.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the post of REGISTRAR. Whole-time post (non-resident). Tenable for 12 months, subject to renewal. Previous experience in ophthalmology essential. The terms and conditions of service for hospital medical and dental staffs will apply.

Applications to be made as soon as possible on forms obtainable from the undersigned. H. R. NORTH, General Superintendent.

MACCLESFIELD HOSPITAL—West Park Branch. Locum SENIOR HOUSE OFFICER (pædiatrics) for duty until mid-July. Salary £15 19s. weekly, less £3 board and lodging.

Apply immediately, quoting 2 referees, to Group Secretary, Macclesfield and District Hospital Management Committee, Willerby House, Cumberland-street, Macclesfield.

MAIDSTONE. PRESTON HALL CHEST HOSPITAL, BRITISH LEGION VILLAGE, MAIDSTONE, KENT. Applications are invited for the post of SENIOR HOUSE OFFICER at the above Hospital which contains 330 Beds for treatment of pulmonary tuberculosis and other chest diseases, and includes a major thoracic surgical unit. Married accommodation available. Salary £819 10s. p.a., national scale and conditions.

Applications, stating age, qualifications and experience, with names and addresses of 2 referees, to be sent to the Group Secretary by 31st May, 1958.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON. 6 months' appointment. Vacant now. Recognised for F.R.C.S. Salary at the rate of £467 10s.–£577 10s. p.a. A deduction at the rate of £125 a year is made for board and lodging, and other services provided.

Applications should be forwarded, as soon as possible, to the Administrative Officer at the Hospital.

MEXBOROUGH. MONTAGU HOSPITAL AND ANNEXE. (198 Beds.) Locum SENIOR HOUSE OFFICER (casualty and orthopædics). £150 p.a. residential emoluments.

Applications to the Secretary to the Committee, Fern Bank, Doncaster-road, Rotherham.

MIDDLESBROUGH GENERAL HOSPITAL, Ayresome Green-lane, MIDDLESBROUGH. (305 Beds.) SOUTH TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (casualty) at the above Hospital. The post offers excellent experience in a very busy department for which there is a whole-time Senior Casualty Officer and 2 whole-time Senior House Officers.

Applications, giving full details, and with names for reference, should be addressed to the Hospital Secretary.

MIDDLESBROUGH. NORTH ORMESBY HOSPITAL. (184 Beds.) SOUTH TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (surgery) for Surgical Team No. 2 at the above Hospital. The post is recognised for pre-registration service under the Medical Act, 1950, and is vacant now.

Applications, stating full details and giving 2 names for reference, should be addressed to the Hospital Secretary as soon as possible.

MIDDLESBROUGH. POOLE HOSPITAL, Nunthorpe, MIDDLESBROUGH. (Chest Diseases—310 Beds.) SOUTH TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER for general duties on medical and surgical wards (adults and children). Salary and conditions of service in accordance with the Ministry of Health regulations. This Hospital is a most modern one with an active Thoracic Surgery Unit.

Applications, stating age, qualifications and previous experience, together with the names of 3 referees, to be sent immediately to the Hospital Secretary, Poole Hospital, Nunthorpe, near Middlesbrough, Yorks.

MORECAMBE. QUEEN VICTORIA HOSPITAL. RESIDENT SENIOR HOUSE OFFICER (surgical). The post is normally tenable 1 year and the successful applicant will be attached to the specialist surgical unit.

Applications, with names of 2 referees, to be addressed to the Group Secretary, Royal Lancaster Infirmary, Lancaster.

NEWARK GENERAL HOSPITAL. Nottingham No. 1 HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (medical) required for above Hospital situated on Great North-road, approximately 20 miles from Nottingham. Post offers good experience. Consultant staff attending Newark Hospital are on 1 or more of the Nottingham Hospitals. Flat available as married quarters. Salary and conditions of service in accordance with Ministry regulations. Duties to commence about 29th April, 1958.

Applications, giving names of 3 referees, should be sent to Group Secretary, Nottingham No. 1 Hospital Management Committee, General Hospital, Nottingham.

NEWCASTLE GENERAL HOSPITAL. (800 Beds.) The following resident posts become vacant on 7th July, 1958:—

* HOUSE PHYSICIANS (4), General Medical Wards. (2 of these posts rotate with the House Physician post in the Cardiovascular Department.)
* HOUSE PHYSICIAN (1), Cardiovascular Department. (This post rotates with the 2 House Physician posts in General Medicine.)
* HOUSE PHYSICIAN (1), Geriatric Unit.
* HOUSE SURGEONS (2), General Surgery (recognised for the F.R.C.S. Diploma).
* HOUSE SURGEON (1), Accident and Admission Department (recognised for F.R.C.S. Diploma).

* These posts are recognised for the purpose of pre-registration service and applications will be accepted from students on the point of taking their qualifying examination.

Applications, together with names and addresses of 2 referees, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4, by 7th June, 1958.

NEWCASTLE GENERAL HOSPITAL. (800 Beds.) WALKERGATE HOSPITAL. (309 Beds.) HOSPITAL FOR SICK CHILDREN. (106 Beds.) The following resident posts become vacant on 7th July, 1958:—

HOUSE PHYSICIANS (5) (pædiatrics), Hospital for Sick Children, Newcastle upon Tyne (2), Children's Department, Newcastle General Hospital (2), and Walkergate Hospital (1). (3 of the posts are for pre-registration candidates (medical and surgical).)

The posts offer experience in the whole of the pædiatric work of the hospitals, including general medicine and surgery and the special departments. There is a close association with the University Department of Child Health. Applications for the pre-registration posts will be accepted from students on the point of taking their qualifying examination.

Applications, together with copies of 2 testimonials, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4, by 7th June, 1958.

NEWCASTLE UPON TYNE HOSPITAL MANAGE-MENT COMMITTEE AND HEXHAM AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Departments of Obstetrics and Gynæcology. Applications are invited for the following posts, vacant on 7th July, 1958:—

(1) **Newcastle General Hospital.** (800 Beds)

Department of Obstetrics and Gynæcology (100 Beds). HOUSE SURGEONS (resident, pre-registration) (2).

This department is recognised for the M.R.C.O.G. and D.Obst.R.C.O.G., and undertakes the training of medical students in the University of Durham. Preference will be given to provisionally registered candidates who have carried out their first house appointment.

(2) **Hexham General Hospital.** (304 Beds)

Gynæcology: HOUSE SURGEON (resident, pre-registration). Recognised for M.R.C.O.G. Applications considered from final-year students in anticipation of graduation.

(3) **Dilston Hall Maternity Hospital, Corbridge.** (50 Beds)

Obstetrics: HOUSE SURGEON (resident, pre-registration). Recognised for D.Obst.R.C.O.G.

Applications, together with copies of 2 testimonials, should be sent to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, by 7th June, 1958.

NEWCASTLE REGIONAL HOSPITAL BOARD. REGISTRAR OBSTETRICIAN AND GYNÆCOLOGIST, whole-time, for South Tees-side Group of hospitals—main hospital Middlesbrough Maternity (80 Beds). Post affords excellent obstetrical and gynæcological experience. Single accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. REGISTRAR PHYSICIANS, whole-time, resident, for Gateshead Group of hospitals—main hospitals Queen Elizabeth (176 Beds) and Bensham General (230 Beds). The Group is very close to a teaching centre. A good medical library and excellent training facilities are available. Single accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWMARKET GENERAL HOSPITAL, Suffolk. Applications are invited for 2 posts of HOUSE PHYSICIAN, vacant 13th and 20th June, 1958. Duties include house charge of general medical and pulmonary tuberculosis beds. The posts are recognised for pre-registration, are resident and tenable for 6 months. Salary in accordance with national scale.

Applications, with 3 recent testimonials, to Medical Superintendent.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. Applications are invited for the post of CASUALTY OFFICER (Senior House Officer) recognised by the Royal College of Surgeons. Vacant 1st June.

Applications, accompanied by 2 testimonials, to be forwarded to the Resident Medical Officer, Mount Vernon Hospital, Northwood, Middlesex, by 22nd May, 1958.

NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applications are invited for the post of HOUSE SURGEON, vacant immediately. Recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applications are invited for the post of HOUSE OFFICER (obstetrics and gynæcology), recognised for pre-registration purposes, which will be graded Senior House Officer or House Officer in accordance with experience. Recognised for the M.R.C.O.G. and D.Obst.R.C.O.G. Post vacant on 2nd July, 1958.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in the Department of Thoracic Surgery. Post vacant 29th June, 1958. Salary £819 10s. p.a. less £150 for residential emoluments. The appointment will be for 1 year.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 testimonials, should be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM CITY HOSPITAL. (811 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT SURGICAL REGISTRAR required. Post vacant 1st August. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th May, 1958, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM CITY HOSPITAL. (811 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT MEDICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th May, 1958, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM CITY HOSPITAL. Plastic Surgery, JAW INJURIES AND BURNS CENTRE. SENIOR HOUSE OFFICER in Plastic Surgery. Previous experience in specialty not essential. The successful candidate will receive a thorough training in plastic surgery and burns. Hospital intakes from Nottingham and Derby areas. Salary £819 10s. less £150 board-residence. Post vacant 6th July, 1958.

Applications, together with copies of 3 testimonials, should be forwarded to the Hospital Secretary, Hucknall-road, Nottingham.

NOTTINGHAM EYE HOSPITAL. Senior House Officer (ophthalmology) required. Duties to commence on 1st June, 1958. Salary and conditions of service in accordance with Ministry regulations.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Resident pre-registration HOUSE PHYSICIAN required mid-June, 1958.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Senior House OFFICER (medical) required. Duties to commence 9th June, 1958.

Applications, stating age, qualifications, experience and nationality, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM. HIGHBURY HOSPITAL, Bulwell, NOTTINGHAM. Applications are invited from fully qualified medical practitioners for the post of SENIOR HOUSE OFFICER (obstetrics) in the Obstetrical and Gynæcological Departments, 48 obstetrical beds, 10 gynæcological beds, and a small block for puerperal pyrexia. This Hospital is recognised for training for the D.Obst.R.C.O.G. The appointment is for a period of 1 year commencing 7th July, 1958. Preference will be given to candidates who have experience in obstetrics and gynæcology. Salary and conditions of service will be in accordance with the Ministry's regulations.

Applications, stating age, experience, qualifications and nationality, with copies of 3 recent testimonials, to be sent to the Hospital Secretary.

OXFORD REGIONAL HOSPITAL BOARD. Orthopædic REGISTRAR (whole-time) to the Nuffield Orthopædic Centre (Wingfield Morris Hospital), Oxford. Available 1st July. Single accommodation available if required. Appointment for 1 year in first instance, renewable for a second year.

Applications on forms obtainable from Secretary, Registrars Committee, 43, Banbury-road, Oxford, should reach him by 31st May, 1958.

OXFORD. UNITED OXFORD HOSPITALS. Applications are invited for the post of NON-RESIDENT REGISTRAR in the Department of Anæsthetics, which will fall vacant shortly, for 1 year in the first instance, eligible for an extension for a second year.

Applications, on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, should be received not later than 3 weeks from the date of this advertisement.

PLYMOUTH. MOUNT GOLD ORTHOPÆDIC HOS-PITAL. Applications are invited for the post of SENIOR HOUSE OFFICER for the Orthopædic and Fracture Service, centring on Mount Gold Orthopædic and associated hospitals. Post recognised by R.C.S.

Applications, stating age, qualifications with dates, &c., and with copies of 2 recent testimonials, to be forwarded to the Secretary, Mount Gold Hospital, Plymouth, within 14 days of this advertisement appearing.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. Vacancies exist in the following departments :—

HOUSE PHYSICIANS, vacancies 3rd and 15th July, 1958. Greenbank Road Hospital.

HOUSE PHYSICIAN, vacant 1st July, 1958. Freedom Fields Hospital.

HOUSE SURGEONS, vacancies 1st, 9th June, and 1st July, 1958. Recognised for the F.R.C.S. Pre-registration posts. Greenbank Road Hospital.

HOUSE SURGEONS, vacancies 2, both on 1st July, 1958. Recognised for the F.R.C.S. Pre-registration posts. Freedom Fields Hospital.

SENIOR HOUSE OFFICER in Anæsthetics, vacant 1st July, 1958. Recognised for the D.A. and F.F.A. R.C.S.

In all cases send names of 3 referees, also stating age, nationality, qualifications and experience, to Group Secretary, 7, Nelson-gardens, Devonport.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL GENERAL HOSPITAL GROUP. Area Pathological Department. Applications invited from duly qualified and registered medical practitioners for the appointment of RESIDENT SENIOR HOUSE OFFICER in Pathology. The post is recognised for non-university experience for D.Path., Royal College of Physicians and Surgeons. The appointment will be for a period of 12 months, in the Area Laboratory at the South Devon and East Cornwall Hospital, Greenbank-road, Plymouth, which provides excellent modern working facilities.

Applications, stating age, nationality, qualifications and experience, together with the names and addresses of 3 referees, to be sent as soon as possible to Group Secretary, 7, Nelson-gardens, Stoke, Plymouth.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Queen Alexandra Hospital (78 medical beds)

HOUSE OFFICER (pre-registration). Vacant 1st July, 1958.

Royal Portsmouth Hospital

Surgical (70 surgical beds).

HOUSE SURGEON (pre-registration). Vacant now.

Medical (61 medical beds).

HOUSE OFFICER (pre-registration). Vacant 19th July, 1958.

Orthopædic (104 orthopædic beds).

HOUSE OFFICER (pre-registration). Vacant 14th July, 1958.

St. Mary's Hospital

Medical (72 medical beds).

HOUSE OFFICER (pre-registration). Vacant 30th June, 1958.

Surgical (120 surgical beds).

HOUSE OFFICER (pre-registration). Vacant now.

HOUSE SURGEON (pre-registration). Vacant now.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be forwarded as soon as possible to E. H. HURST, St. Mary's Hospital, Milton-road, Portsmouth.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Locum OBSTETRIC AND GYNÆCOLOGICAL REGISTRAR to the Portsmouth Group of Hospitals, for a period of approximately 3 months from 4th June, 1958.

Please apply immediately, stating qualifications and experience, together with names of 2 referees, to the Group Secretary, Portsmouth Group Hospital Management Committee, Saint Mary's Hospital, Portsmouth.

READING AREA DEPARTMENT OF MEDICINE. Applications invited from registered and provisionally registered medical practitioners for 2 RESIDENT HOUSE PHYSICIAN posts, for 6 months from 1st June. Successful candidates required to carry out duties at following Reading Hospitals : Royal Berkshire (397 Beds) and Prospect Park (104 Beds).

Write, stating age, qualifications with dates, nationality, present post, with copies of 2 recent testimonials, to Secretary, Royal Berkshire Hospital, Reading.

READING. BATTLE HOSPITAL. (391 Beds.) Reading AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of RESIDENT JUNIOR HOUSE SURGEON (pre- or post-registration) required in the Accident and Orthopædic Department. F.R.C.S. recognised. Also casualty duties. Vacant 18th May, 1958.

Apply, stating age, qualifications with dates, nationality, present post, with copy of recent testimonial, to Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (397 Beds.) Applications are invited from registered and provisionally registered medical practitioners for 2 RESIDENT HOUSE SURGEON posts (1 immediately, 1 1st June) for 6 months.

Write, stating age, qualifications with dates, nationality, present post, with copies of 2 recent testimonials, to Secretary.

REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road, REDHILL, SURREY. RESIDENT HOUSE SURGEON (Male). Pre-registration appointment vacant immediately. Opportunity of House Physician's post to follow if required.

Applications to Hospital Secretary.

PERTH. COUNTY AND CITY OF PERTH GENERAL HOSPITALS. The following House Officer posts will fall vacant on 1st August, 1958 :—

Bridge of Earn Hospital

* 2 SENIOR HOUSE SURGEONS (Fracture and Orthopædic Unit).
* 3 HOUSE SURGEONS (Fracture and Orthopædic Unit).
* 1 SENIOR HOUSE SURGEON (General Surgical Wards).
* 3 HOUSE SURGEONS (General Surgical Wards).
† 1 HOUSE OFFICER (gynæcology and obstetrics).
‡ 1 HOUSE SURGEON or SENIOR HOUSE SURGEON (E.N.T. Ward).
3 HOUSE PHYSICIANS (General Medical Wards).
1 SENIOR HOUSE PHYSICIAN (General Medical Wards).
§ 1 SENIOR HOUSE OFFICER (anæsthetics).

Perth Royal Infirmary

* 2 HOUSE SURGEONS (General Surgical Wards).
* 1 HOUSE SURGEON or SENIOR HOUSE SURGEON (casualty).
3 HOUSE PHYSICIANS (General Medical Wards).

Notes :—

1. Senior House Officer posts are tenable for 12 months and Junior House Officer posts for 6 months, with the exception of the gynæcology and obstetrics post shown under Bridge of Earn Hospital ; this post is tenable for 12 months and consists of 6 months' gynæcology at Bridge of Earn Hospital, followed by 6 months' obstetrics at Perth Royal Infirmary.

2. All Junior House Officer posts are recognised for pre-registration hospital service.

3. Posts marked * are recognised by the Royal College of Surgeons under the regulations for the F.R.C.S.

4. Post marked † is recognised both for gynæcology and obstetrics under the regulations for the M.R.C.O.G. The obstetrics post at Perth Royal Infirmary is also recognised for the Diploma in Obstetrics of the Royal College of Gynæcologists.

5. Post marked ‡ is recognised under the regulations for the D.L.O.

6. Post marked § is recognised under the regulations for the D.A. and F.F.A. R.C.S.

Applications, giving age, qualifications, experience and names of 2 referees, should be sent to the Group Medical Superintendent, Perth Royal Infirmary, Perth.

RHYL. PRINCE EDWARD WAR MEMORIAL HOS-PITAL. (42 Beds.) Applications are invited for the appointment of a Locum SENIOR HOUSE OFFICER (resident) in Orthopædics at the above Hospital for an approximate period of 3 months.

Applications, accompanied by copies of 2 recent testimonials, should be sent forthwith to the Group Secretary, Clwyd and Deeside Hospital Management Committee, Rhianfa, Russell-road, Rhyl.

RICHMOND, SURREY. ROYAL HOSPITAL. (121 Beds.) KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited from suitably qualified and experienced medical officers for the appointment of Full-time RESIDENT REGISTRAR (general surgery) which will become available shortly. Single or married quarters will be available.

Forms of application may be obtained from the Group Secretary (a foolscap stamped-addressed envelope to be enclosed), and the completed forms should be returned to the Group Secretary, 35, Coombe-road, Kingston-upon-Thames, within 14 days of the appearance of this advertisement.

RICHMOND, SURREY. ROYAL HOSPITAL. Pre-registration HOUSE SURGEON required 28th May, 1958, for busy acute general hospital (121 Beds) with full Consultant staff.

Applications invited immediately (acceptable in advance of examination results), giving age, qualifications, and names of 2 referees, to Administrative Officer.

ROCHDALE AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. SENIOR HOUSE OFFICER (medicine) (Assistant Resident Medical Officer) required immediately at Birch Hill General Hospital. Resident staff includes Registrar (Resident Medical Officer) and 3 House Physicians.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs.

ROCHDALE AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. HOUSE OFFICER (surgery) required immediately for busy Surgical Unit. Post recognised for F.R.C.S. qualification and offering excellent experience.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs.

RYDE, I.W. ROYAL I.W. COUNTY HOSPITAL. Senior HOUSE OFFICER required immediately as Assistant Casualty/Orthopædic Officer.

Applications, with names of 2 referees, to Hospital Secretary.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) ORTHOPÆDIC HOUSE SURGEON (resident) required in the Orthopædic and Accident Unit from 26th May, 1958. The service consists of 100 Beds equally divided between traumatic surgery and "cold" orthopædics. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications to be sent to Group Secretary, Romford Hospital Management Committee, Oldchurch Hospital, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER (neurosurgery) required from 21st June, 1958. Suitable for candidates seeking higher medical or surgical qualifications. Recognised for the F.R.C.S. (Eng.).

Apply to Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE SURGEON (Male) required immediately. Not pre-registration appointment.

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) 2 Locum MEDICAL REGISTRARS required; 1 post vacant now in medicine, and 1 vacant on 1st June in medicine and infectious diseases, probably for 2–3 months. Applications at once to Medical Superintendent.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT HOUSE SURGEON/HOUSE PHYSICIAN to run consecutively in this order for a period of 6 months in each post from 1st July. Posts open to pre-registration candidates.

Apply, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Pædiatric House OFFICER required at Odstock Branch. 55 medical and surgical beds. Recognised for D.C.H. Vacant 25th July.

Applications, with names and addresses of 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT HOUSE PHYSICIAN for a period of 6 months from 1st July. Post open to pre-registration candidates.

Apply, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT HOUSE SURGEON/OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON (recognised by R.C.O.G.) for a period of 6 months in each post from 20th July. Posts open to pre-registration candidates.

Apply, giving names and addresses of 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. Anæsthetics. Dundee Teaching Hospitals. Applications are invited for a post as SENIOR REGISTRAR in Anæsthetics at the Dundee Teaching Hospitals—Dundee Royal Infirmary (557 Beds) and Maryfield Hospital (370 Beds), the main general teaching hospitals associated with the University of St. Andrews. There will be associated with the appointment the post of Tutor in Clinical Anæsthesia in the University of St. Andrews. Salary and conditions of service in accordance with national agreement.

Forms of application and further particulars from the Secretary to the Board, Bracknowe, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 31st May, 1958.

SCOTLAND. NORTH-EASTERN REGIONAL HOS-PITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in Anæsthetics on the staffs of the Aberdeen General Hospitals and the Aberdeen Special Hospitals. Candidates preferably should hold a higher qualification in anæsthetics.

Applications, giving the names of 2 referees, should be submitted by 7th June, 1958, to the Senior Administrative Medical Officer, 1, Albyn-place, Aberdeen, from whom further particulars and a form of application may be obtained.

SCOTLAND. SOUTH-EASTERN REGIONAL HOS-PITAL BOARD. REGISTRAR in Ophthalmology, Royal Infirmary, Edinburgh.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 7th June, 1958.

SCOTLAND. SOUTH-EASTERN REGIONAL HOS-PITAL BOARD. REGISTRAR in Ophthalmology in the Professorial Unit at the Royal Infirmary, Edinburgh.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 7th June, 1958.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments which will be for 1 year in the first instance :—

SENIOR REGISTRAR in Ophthalmology based at the Glasgow Ophthalmic Institution.

SENIOR REGISTRAR in Hæmatology based at Stobhill General Hospital, Glasgow.

REGISTRAR in Medicine based at Larkfield Hospital, Greenock.

REGISTRAR in Medicine based at the Medical Unit, Gartloch Hospital, Gartcosh, Glasgow.

REGISTRAR in E.N.T. Surgery based at the E.N.T. Hospital, Glasgow.

REGISTRARS in General Surgery with duties on a yearly rotational basis at the Victoria Infirmary, Glasgow, and at the Royal Infirmary, Dumfries. Experience will be obtained in other branches of surgery. Housing accommodation available at Royal Infirmary, Dumfries.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 31st May, 1958.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD.

Locum SENIOR REGISTRAR in Anæsthetics required at the Western Infirmary, Glasgow, for a period of 1 year from 1st October, 1958.

Locum REGISTRAR in Medicine required at Stobhill General Hospital, Glasgow, for a minimum period of 1 year from 1st October, 1958.

Applications, with details of age, qualifications, experience, present appointment, and the names of 3 referees, to the Secretary, Western Regional Hospital Board, 64, West Regent-Street, Glasgow, C.2.

SHEFFIELD, 5. CITY GENERAL HOSPITAL. Resident Locum SENIOR HOUSE OFFICER (general medicine) required from 1st June, 1958, for approximately 3 weeks. Rate of pay £15 19s. per week.

Apply, giving full details, to the Group Secretary, Sheffield No. 1 Hospital Management Committee, Lyndhurst, Nether Edge Hospital, Sheffield, 11.

SHEFFIELD, 5. CITY GENERAL HOSPITAL. Locum SENIOR HOUSE OFFICER (orthopædics) required for the period up to 14th July, 1958. Rate of pay £15 19s. per week.

Apply, giving full details, to the Group Secretary, Sheffield No. 1 Hospital Management Committee, Lyndhurst, Nether Edge Hospital, Sheffield, 11.

SHEFFIELD. LODGE MOOR HOSPITAL. (467 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (infectious diseases) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th May, 1958, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited for the following posts :—

(*a*) REGISTRAR in Thoracic Surgery at the Royal Infirmary. Post vacant 5th July, 1958.

(*b*) REGISTRAR to the Department of Radiology, Royal Infirmary/Royal Hospital.

Applications for both posts, with the names of 3 referees, to be sent to the Chief Administrative Officer, United Sheffield Hospitals, West-street, Sheffield, 1, by 31st May, 1958.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. HOUSE SURGEON, 1 of 2, required. Pre-registration post vacant 9th June.

Applications, with names of 2 referees, to Secretary by 22nd May.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Obstetrics and Gynæcology to fill a vacancy in the approved trainee establishment at the Brighton and Lewes Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staff (England and Wales) and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience, with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, 11, Portland-place, W.1, not later than 31st May, 1958.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Urology to fill a vacancy in the Canterbury Group of hospitals, for duty mainly at the Kent and Canterbury Hospital. The successful candidate will also undertake duty at the Royal Sea Bathing Hospital, Margate, in the Isle of Thanet Group of hospitals, where there is work in genitourinary tuberculosis. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staff (England and Wales) and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 31st May, 1958.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for a whole-time appointment as NON-RESIDENT MEDICAL OFFICER (second-year Registrar) to fill a vacancy in the approved establishment at the Hastings Group of hospitals. The salary will be £1061 10s. p.a., and the appointment will be in accordance with the terms and conditions of service of hospital medical and dental staff (England and Wales) and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience, with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 31st May, 1958.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Pathology to fill a vacancy in the approved trainee establishment at the Brighton and Lewes Group of hospitals. The post is non-resident but the successful candidate will be expected to reside near the Royal Sussex County Hospital and to take a share of emergency night duties in the group. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staff (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 31st May, 1958.

SOUTHEND. GENERAL HOSPITAL. (262 Beds.) Applications are invited from registered or provisionally registered practitioners for 2 posts as RESIDENT HOUSE SURGEONS. 1 post now vacant; second post vacant 4th June, 1958.

Applications, stating age, qualifications and previous experience, with copies of recent testimonials (1 testimonial sufficient from applicants for first appointment), should reach the undersigned as soon as possible. J. C. FIELD, Secretary.

SOUTHEND-ON-SEA GENERAL HOSPITAL. Applications are invited for the post of RESIDENT DEPUTY CASUALTY OFFICER (Senior House Officer grade) with duties in the Fracture and Orthopædic Department for a period of 6 months. Post now vacant, and recognised for the F.R.C.S.

Applications, stating age, qualifications and experience, with copies of recent testimonials, to reach the Secretary as soon as possible.

STOCKPORT. STEPPING HILL HOSPITAL. (529 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (pædiatrics). The post, which may be either resident or non-resident, becomes vacant on 1st June, 1958.

Applications, stating age, qualifications and experience, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

STOCKPORT AND BUXTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics) with duties at Stepping Hill Hospital, Stockport (529 Beds.), and Stockport Infirmary (163 Beds). The post is recognised for the D.A. and F.F.A. R.C.S., and there are ample opportunities for study.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

SOUTH WESTERN REGIONAL HOSPITAL BOARD AND UNITED BRISTOL HOSPITALS. Applications are invited by the above Boards for 2 joint appointments of REGISTRAR in Pædiatrics. The appointments will be held for 1 year in the first instance commencing on 1st September, 1958, and will be renewable for a further year. For the first year 1 of the successful candidates will work at the South Devon and East Cornwall Hospital, Plymouth, and the other will work in the United Bristol Hospitals with main duties in the Bristol Royal Hospital for Sick Children and the Bristol Maternity Hospital, a post in which the holder is normally appointed Tutor in Child Health in the University of Bristol. When the appointments are renewed for a second year, the 2 Registrars will interchange.

Applications, stating date of birth, qualifications and experience together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 30th May, 1958.

STIRLING AND CLACKMANNAN HOSPITALS BOARD OF MANAGEMENT. There is a vacancy for a Locum JUNIOR HOUSE OFFICER (obstetrics) at Airthrey Castle Maternity Hospital for the period 8th June–31st July, 1958.

Applications should be sent immediately to the Group Medical Superintendent, Stirling Royal Infirmary.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. SENIOR HOUSE OFFICER in General Surgery required (6 months' appointment). Hospital recognised for F.R.C.S. Post vacant very shortly.

Applications to Hospital Secretary as soon as possible.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. SENIOR HOUSE OFFICER (anæsthetics) required. Post recognised for F.F.A. R.C.S. and D.A. Medical library facilities available.

Detailed applications to Hospital Secretary as soon as possible.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (general surgery) required. Recognised for F.R.C.S. Post vacant very shortly.

Detailed applications, with copy testimonials, to Hospital Secretary, as soon as possible.

SWANSEA HOSPITAL, Swansea. (413 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER in the Traumatic and Orthopædic Department of the above Hospital. The post is recognised under the F.R.C.S. regulations for 6 months' casualty training. It offers exceptional experience in all aspects of traumatic surgery as occurring in a large industrial centre and port.

Applications, stating age and experience, together with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary. T. E. JONES, Group Secretary.

SWANSEA HOSPITAL, Swansea. (413 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Locum JUNIOR HOSPITAL MEDICAL OFFICER in the Casualty Department for the above Hospital for the period 10th–20th June, 1958.

Applications with full particulars should be sent to the Hospital Secretary. T. E. JONES, Group Secretary.

SWANSEA HOSPITAL, Swansea. (413 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of SENIOR HOUSE OFFICER in the Ophthalmic Department of the above Hospital. Vacancy 1st June, 1958. The post is recognised for the F.R.C.S.(Eng.) and D.O. examinations.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to the Hospital Secretary. T. E. JONES, Group Secretary.

TAUNTON AND SOMERSET HOSPITAL, Taunton, SOMERSET. (423 Beds.) HOUSE OFFICERS (general surgery) required. 2 pre-registration posts recognised for F.R.C.S., vacant 22nd June, 1958, and 8th July, 1958, respectively.

Applications, stating age, nationality and qualifications, to the Group Secretary, Taunton Hospital Management Committee, c/o Musgrove Park Hospital, Taunton.

TAUNTON AND SOMERSET HOSPITAL. Senior House OFFICER (anæsthetics) required. Post vacant 13th June, 1958, is recognised for F.F.A. R.C.S. and D.A. A Registrar in Anæsthetics is also employed in the South Somerset Clinical Area, in which the above is the principal general hospital.

Applications, stating age, nationality, experience in anæsthetics (if any), together with the names of 2 referees, to the Group Secretary, Taunton Hospital Management Committee, Musgrove Park Hospital, Taunton, immediately.

TORQUAY. TORBAY HOSPITAL. (166 acute general beds.) HOUSE OFFICER (medicine), Male or Female, required for mid-June, 1958. Pre-registration appointment. General duties which will include some work in the E.N.T., the Ophthalmic, and Radiotherapy Departments.

Applications, stating qualifications, nationality, age, together with copy testimonials (quoting Ref. F. 955/91), to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

WATFORD GROUP OF HOSPITALS. North West METROPOLITAN REGIONAL HOSPITAL BOARD. RESIDENT REGISTRAR in Obstetrics and Gynæcology required for above Group. Post vacant 1st July. Post recognised M.R.C.O.G.

Application form obtainable from Group Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Herts, by not later than 27th May, 1958.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. (211 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer grade) to the Watford Hospitals. Post vacant 1st July.

Applications, together with copies of not more than 2 recent testimonials, to the Administrator.

WATFORD. SHRODELLS HOSPITAL. (General Hospital —320 Beds.) Applications are invited for the post of GYNÆCOLOGICAL HOUSE OFFICER (Junior Hospital Medical Officer grade) required to start middle of June. Post recognised for the M.R.C.O.G.

Applications, together with copies of 2 testimonials, should reach the Medical Administrator as soon as possible.

WARRINGTON INFIRMARY. Applications are invited from Males and Females for the post of RESIDENT CASUALTY OFFICER (graded as Junior Hospital Medical Officer) at the above Hospital. The post is recognised for the F.R.C.S. Scale of salary £852 10s.–£55–£1182 10s. less a deduction of £170 for residential emoluments. A whole-time Senior Hospital Medical Officer is in charge of the Department.

Applications, stating age, experience and qualifications, should be forwarded to :—

HENRY L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WELSH REGIONAL HOSPITAL BOARD.

REGISTRAR (psychiatry) Morgannwg Hospital, Bridgend (all modern treatments, active outpatient clinics, Child Guidance Clinic and Psychological Department). Within easy reach of University of Wales. Previous psychiatric experience not essential. Accommodation available.

REGISTRAR (plastic surgery), St. Lawrence Hospital, Chepstow. (182 Beds.) Expected to visit other hospitals in South Wales area. Considerable opportunities for training in specialty. Accommodation for single person.

REGISTRAR in Thoracic Surgery. Based at Morriston Hospital, Morriston, near Swansea, also expected to serve other hospitals in the district. Unit has 60 Beds and is Thoracic Centre for South West Wales, dealing with all types of cardiac and thoracic surgery including tuberculous, non-tuberculous, and œsophageal. Resident/non-resident.

Subject of review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WEST CUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER in Anæsthetics required for work throughout the West Cumberland Group but based on Whitehaven Hospital. Good experience essential, and possession of the D.A. preferred.

Apply, with full information as to qualifications and experience, and giving the names of 2 referees, to the Group Secretary at Workington Infirmary.

WICKFORD (near), ESSEX. RUNWELL HOSPITAL. (1052 Beds.) SENIOR HOUSE OFFICER (Male or Female) required for one of the Consultant's divisions and to assist in outpatient work. Excellent postgraduate facilities for D.P.M. Salary £819 10s.; residential charge £150.

Applications, with copies of testimonials, to the Secretary.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COM-MITTEE. ASTLEY HOSPITAL, ASTLEY, near MANCHESTER. SENIOR HOUSE OFFICER in Surgery required. Duties include gynæcology and casualty. Resident post. Vacant now.

Apply Secretary, Knowsley House, Wigan.

WINCHESTER AND LORD MAYOR TRELOAR GROUPS. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Anæsthetics (Registrar grade) required at Alton General Hospital, with duties at Lord Mayor Treloar and Henry Gauvain Hospitals, Alton, and the Royal Hampshire County Hospital, Winchester. Post recognised for the F.F.A. R.C.S., and is resident or non-resident. Vacant June, 1958.

Forms of application obtainable from Group Secretary, Royal Hampshire County Hospital, Winchester.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (327 Beds.) HOUSE OFFICER (anæsthetics). Post vacant 1st July. The Hospital is recognised for the F.F.A. R.C.S. and D.A.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (327 Beds.) HOUSE SURGEON to the Senior Surgeon. Post vacant immediately.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (327 Beds.) HOUSE SURGEONS (2) (posts recognised by Royal College of Surgeons) required for general surgery with some E.N.T. duties. Approved pre-registration posts. 1 vacant immediately; the other vacant 1st June.

Applications, with copies of 2 testimonials, to Group Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. House SURGEON in General Surgery required, Male or Female, for post vacant 14th June. Recognised for F.R.C.S. Pre-registration post.

Applications, stating age, nationality, qualifications and copies of recent testimonials, to Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An associated hospital of the Birmingham University Medical School.) ORTHOPÆDIC SENIOR HOUSE SURGEON for Fracture and Orthopædic Department. Post recognised for F.R.C.S. Vacant immediately.

Apply, with 2 testimonials, to the Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An associated hospital of the Birmingham University Medical School.) Pre-registration HOUSE OFFICERS (general surgery). Vacancies occur 2nd, 9th, and 17th July. All posts recognised for F.R.C.S.

Apply, giving age and qualifications and copies of 2 testimonials, to the Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An associated hospital of the Birmingham University Medical School.) SENIOR HOUSE OFFICER (anæsthetics). Post vacant 21st May. Recognised for D.A. and F.F.A. R.C.S. Flat available for married applicant.

Apply, with copies of 2 testimonials, to the Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An associated hospital of the Birmingham University Medical School.) Pre-registration HOUSE OFFICERS (general medicine). Vacancies occur on 2nd and 9th July, and 1st August.

Apply, giving age and qualifications and copies of 2 testimonials, to the Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An associated hospital of the Birmingham University Medical School.) Pre-registration HOUSE OFFICER (pædiatrics). Post recognised for D.C.H. Vacant 27th July.

Apply, giving age and qualifications and copies of 2 testimonials, to the Secretary.

WOODFORD BRIDGE, WOODFORD GREEN, ESSEX. CLAYBURY HOSPITAL (for nervous and mental disorders). Applications are invited for the post of Full-time SENIOR HOUSE OFFICER, resident or non-resident. Board-residence for an unmarried applicant, for which a charge of £150 p.a. will be made, is available. The Hospital has over 2000 Beds and an admission-rate of over 1300 a year. All forms of treatment are undertaken and outpatient clinics at general hospitals are run by the hospital staff. Clinical conferences and seminars for the D.P.M. candidates are held weekly and facilities will be offered to attend lectures in London (1 hour's journey). Previous general but not psychiatric experience necessary.

Applications, with full particulars and the names and addresses of 2 referees, to be sent to the Physician-Superintendent not later than 7 days after the appearance of this advertisement.

WORTHING GROUP HOSPITAL MANAGEMENT COM-MITTEE. Vacant immediately : post of THORACIC MEDICAL REGISTRAR. Inpatient and outpatient work in 2 large general hospitals in all branches of thoracic medicine, with supervision of a small number of tuberculosis patients in a neighbouring hospital. Previous general medicine and chest experience necessary. Car essential.

Application forms are obtainable from the undersigned and should be returned within 21 days of the appearance of this advertisement. A. V OAKTON, Group Secretary.

Worthing Group Hospital Management Committee,
129, Brighton-road, Worthing, Sussex.

DUBLIN. ROYAL VICTORIA EYE AND EAR HOSPITAL. E.N.T. Department. HOUSE SURGEON, for above Department, required. Appointment for 1 year from 1st July, 1958. Salary £275 p.a., with free board, lodging, and laundry.

Applications, with testimonials, to be forwarded to the Registrar before 31st May, 1958.

MICHIGAN, U.S.A. OAKWOOD HOSPITAL, Dearborn, MICHIGAN. Applications are invited for 1 year approved ROTATING INTERNSHIP beginning 1st July, 1958. 234-Bed General Hospital 10 miles from Detroit. Excellent facilities. Hospital approved for exchange-visitor programme. Salary $200 if single, $250 if married. Housing rent-free.

Apply Director.

NEW YORK. NEW ROCHELLE HOSPITAL, New ROCHELLE, NEW YORK, U.S.A. (383-Bed general community hospital.) Approved by the Joint Commission on Accreditation of Hospitals. Also approved by the American College of Surgeons and American Medical Association for Internship and Residency training. Only graduates from approved university schools accepted. Internships available for the 1-year term commencing 1st July, 1958. Stipend is $200 per month plus complete maintenance.

Apply Superintendent.

U.S.A. EMILY P. BISSELL HOSPITAL, Wilmington, DELAWARE, U.S.A. HOUSE PHYSICIAN, position available 1st July, 1958. Modern 215-Bed accredited tuberculosis hospital on Atlantic seaboard, 2 hours from New York. Salary, with 1 year experience in tuberculosis, $7200. Junior staff member, $6000. Furnished apartment and utilities.

Address, E. W. HAINLEN, M.D., Medical Director, Emily P. Bissell Hospital, 3000, Newport Gap Pike, Wilmington, 8, Delaware.

Public Appointments

FACTORY DOCTORS. Factories Acts 1937 and 1948. The following appointment as Appointed Factory Doctor is vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
MILNGAVIE	DUMBARTON	31ST MAY, 1958

BIRMINGHAM. CITY OF BIRMINGHAM. Public Health DEPARTMENT. Applications are invited from registered medical practitioners for post of ADMINISTRATIVE MEDICAL OFFICER OF HEALTH (Male or Female). Candidates should hold the Diploma of Public Health. This is a sectional post and the Medical Officer will be primarily responsible to the Medical Officer of Health for the administration of activities relating to Maternity and Child Welfare Services but will also be available for all other work of the Health Department. Applicants should, therefore, have had extensive experience in maternity and child welfare work and experience in all other branches of public health. Salary scale £2065–£75–£100 (2)–£2340 p.a. Commencing salary within the scale will depend upon the Medical Officer's experience. Pension scheme (including widows and orphans) ; medical examination. The Officer appointed will be required to devote his/her whole time to official duties and the appointment will be subject to 3 months' notice on either side.

Applications, with names of 3 persons to whom reference may be made, to be sent to the Medical Officer of Health, Council House, Birmingham, 3, not later than 26th May, 1958.

NAVY, ARMY, AND AIR FORCE INSTITUTES. Applications are invited from medical practitioners (Female) with a wide experience of general medicine for the part-time appointment (1 session weekly) of ASSISTANT MEDICAL OFFICER at the Headquarters of this Corporation.

Applications, stating age, nationality, qualifications and experience should be sent to Chief Medical Officer, Navy, Army, and Air Force Institutes, Kennington-lane, London, S.E.11, not later than 27th May, 1958.

GLASGOW. CORPORATION OF GLASGOW. Health AND WELFARE DEPARTMENT. Applications are invited from qualified medical Women for the post of ASSISTANT MEDICAL OFFICER, Maternity and Child Welfare. Applicants should have hospital experience in both obstetrics and diseases of children, and preferably hold the Diploma in Child Health or Diploma in Public Health. Salary £1050–£50–£55–£1475. The post is superannuable, subject to medical examination.

Applications, stating age, qualifications and full details of training and experience, together with names of 3 referees, to be lodged with me in an envelope marked "Appointment. Assistant Medical Officer, Maternity and Child Welfare", by 27th May, 1958.

City Chambers, Glasgow. WILLIAM KERR, Town Clerk.

GREENOCK. CORPORATION OF GREENOCK. Applications are invited from registered medical practitioners, having previous experience in public health work and possessing the Diploma in Public Health or other equivalent qualification, for the position of DEPUTE MEDICAL OFFICER OF HEALTH AND DEPUTE PORT MEDICAL OFFICER for the Burgh. The appointment is whole-time, terminable on 3 months' notice, and is subject to the provisions of the Local Government Superannuation (Scotland) Acts. The salary scale is £1233 6s. 8d., rising by 4 annual increments of £55 and 1 of £50 to £1503 6s. 8d. p.a. with placing according to experience. If desired, housing accommodation will be offered to the successful applicant.

Applications, stating age, present and previous appointments, qualifications and other relevant information, together with the names and addresses of 2 referees, should be lodged with the undersigned not later than Wednesday, 21st May, 1958.

JOHN LIDDELL, Town Clerk.

Municipal Buildings, Greenock, 1st May, 1958.

LINCOLN. COUNTY OF LINCOLN (Parts of Lindsey). ASSISTANT COUNTY MEDICAL OFFICER AND MEDICAL OFFICER OF HEALTH for the Cleethorpes Borough and Grimsby Rural District. Applications are invited from registered medical practitioners with experience in public health work and holding a Diploma in Public Health, Sanitary Science or State Medicine for the above whole-time mixed appointment. The salary, which is in accordance with recommendations of the Medical Whitley Council Committee C as adopted by the County Council, will commence at £1708 10s. p.a. and will rise by 3 annual increments of £58 10s., 1 of £61 8s. 4d., and 4 of £32 1s. 8d., to a maximum of £2073 15s., and the officer appointed will be placed on the appropriate step of the scale having regard to his experience. The appointment will be subject to the Local Government Superannuation Acts, 1937 and 1953.

Forms of application and further particulars obtainable from the Clerk of the County Council, County Offices, Lincoln, to whom completed applications must be returned, not later than 4th June, 1958.

W. E. LANE, Clerk of the Lindsey County Council.

WARWICKSHIRE COUNTY COUNCIL and BOROUGH OF NUNEATON, BEDWORTH URBAN DISTRICT and ATHERSTONE RURAL DISTRICT. ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH AND DEPUTY MEDICAL OFFICER OF HEALTH. Applications are invited from duly qualified medical practitioners for the post of Assistant County Medical Officer of Health with the Warwickshire County Council, and the successful candidate will also be appointed Deputy Medical Officer for the Borough of Nuneaton, the Bedworth Urban District, and the Atherstone Rural District, which posts together constitute a whole-time appointment, the time being allocated equally between County Council and County District Council duties. The officer appointed must hold the Diploma in Public Health. The aggregate salary will be £1396 5s. p.a., rising to a maximum of £1796 17s. 6d. p.a. Consideration will be given to the granting of financial assistance towards removal expenses.

Conditions of appointment and forms of application may be obtained from the County Medical Officer of Health, Shire Hall, Warwick, by whom completed forms of application must be received not later than 31st May, 1958.

L. EDGAR STEPHENS,
Clerk of the County Council.
A. A. CRABTREE,
Town Clerk, Nuneaton.
S. G. DEEMING,
Clerk of the Bedworth Urban District Council.
G. CARLYON MAY,
Clerk of the Atherstone Rural District Council.

YORKSHIRE. COUNTY COUNCIL OF THE WEST RIDING OF YORKSHIRE. Joint appointment of SENIOR ASSISTANT COUNTY MEDICAL OFFICER AND SCHOOL MEDICAL OFFICER to the Ilkley Urban District Council, Otley Urban District Council, Wharfedale Rural District Council, and the West Riding County Council. Applications invited from registered medical practitioners with at least 3 years' experience since qualification, and holding the D.P.H. or nearing completion of training for the D.P.H. Duties mainly in the school health and infant welfare services, but in addition person appointed will be required to act for the Divisional Medical Officer and Medical Officer of Health in his absence, and will be appointed Deputy Medical Officer of Health to the constituent authorities. Salary £1150–£1575 p.a. County Council scale of travelling and subsistence allowances. Post superannuable and subject to medical examination.

Forms of application from the undersigned to be returned not later than 24th May, 1958.

J. WOOD-WILSON, County Medical Officer.

County Hall, Wakefield.

NORFOLK. COUNTY OF NORFOLK. Assistant County Medical Officer and District Medical Officer of Health. The Norfolk County Council and the County District Councils concerned invite applications from registered medical practitioners holding the Diploma in Public Health for the whole-time appointment of ASSISTANT COUNTY MEDICAL OFFICER AND DISTRICT MEDICAL OFFICER OF HEALTH for Area No. 7 comprising Downham Market Urban District, Downham Rural District and Marshland Rural District, with a total population of approximately 43,000. The person appointed will be employed for 7/11ths of his time as Assistant County Medical Officer and 4/11ths as District Medical Officer of Health. He will act as an Assistant County Medical Officer under the direction of the County Medical Officer and as District Medical Officer of Health he will be subject to the instructions of the District Councils concerned. The combined salary scale will be £1646 rising to a maximum of £1917 p.a. Travelling and subsistence expenses will be paid in accordance with the County Council's scales.

Application forms, together with further particulars of the appointment, can be obtained from the County Medical Officer, 29, Thorpe-road, Norwich, to whom completed application forms should be returned not later than 28th May, 1958.

NOTTINGHAM. CITY OF NOTTINGHAM EDUCATION COMMITTEE. Applications are invited for the post of Whole-time SCHOOL MEDICAL OFFICER on the salary scale £1050 rising to £1475 p.a.

Further particulars and forms of application may be obtained from the Principal School Medical Officer, 28, Chaucer-street, Nottingham.

GOVERNMENT OF BRITISH GUIANA. Medical SUPERINTENDENT required to take charge of Mental Hospital at Berbice, to supervise staff, patients, revenue and expenditure, and the psychiatric clinic held monthly at Georgetown.

Appointment as follows:—

(*a*) On contract for 3 years with gratuity (taxable) of 22½% of basic salary payable at 6-monthly intervals or in lump sum on completion of engagement; or

(*b*) from National Health Service retaining superannuation rights (up to 6 years) and receiving a gratuity (taxable) of 20% of aggregate salary after engagement.

Salary £1800 a year plus allowance of £250 in lieu consultation fees. No private practice. Income-tax at local rates. Free unfurnished quarters provided. Generous leave. Free passages for officer, wife, and children under 18, not exceeding 5 persons in all, on appointment and completion of engagement. Candidates must possess medical qualifications registrable in United Kingdom and have had 2 years' experience in mental hospital. Diploma in Psychological Medicine highly desirable.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting BCD.117/30/05).

HER MAJESTY'S OVERSEAS CIVIL SERVICE. Trinidad. Applications invited from doctors with medical qualifications registrable in the United Kingdom for the following posts:—

PATHOLOGIST, Grade A, to work under Supervisor of Laboratories, undertake responsibility for all technical methods and processes in examination of specimens and patients in various pathological laboratories under Government control; act as Senior Pathologist in absence of Supervisor of Laboratories and in that capacity undertake administrative and financial responsibilities as required. Higher qualification in pathology desirable plus 5 years' whole-time practice of pathology, and experience in morbid anatomy and morbid histology. Salary scale £1500–£1600 a year. Consulting practice permitted or allowance of £200 a year paid in lieu.

MEDICAL OFFICERS, Grade B (Institutions), for general medical, surgical and other duties of Hospital Medical Officer in any institution in the Colony. Higher qualification, or more than 6 years' approved post-registration experience required. Salary scale £1400–£1500 a year.

MEDICAL OFFICERS, Grade C (Institutions), for general duties of a Resident Medical Officer in any medical institution in the Colony. Salary scale £950–£1350 a year.

Appointment on permanent basis with pension (non-contributory) or on short-term contract with gratuity (taxable) £25–£37 10s. a quarter; or from National Health Service with retention of superannuation rights up to 6 years plus gratuity (taxable) of 20% of aggregate salary. Only permanent officers are members of Her Majesty's Overseas Civil Service. Quarters, if available, at low rental or allowance in lieu. Free passages on appointment for officer and family not exceeding 5 persons in all. Leave passages on certain conditions up to 3 adult fares. Income-tax at local rates. Generous leave, Educational facilities.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting BCD.117/38/05).

TASMANIA. Department of Health Services. Applications, closing on 30th May, 1958, are invited for 2 posts of whole-time employed PSYCHIATRISTS attached to the Department of Health Services. Each application should be accompanied by 2 recent testimonials and the names of 2 referees.

Qualifications.—Applicants must possess medical qualifications registrable with the Medical Council of Tasmania, and preference will be given to applicants holding the D.P.M. or equivalent qualification.

Duties.—On appointment, the successful applicants will be seconded for duties at Lachlan Park Mental Hospital and will be responsible to the Director of Mental Health through the Medical Superintendent of the Hospital.

Nature of appointments.—The appointments are not made under the Public Service Act. Termination of appointment is subject to 3 months' notice by the appointee or the Director-General of Health Services. No private practice is permitted.

Salary.—At the rate of £A3000 p.a.

Accommodation.—Furnished residences are available for both Psychiatrists on a rental basis.

Superannuation.—Is available.

Leave.—28 days' annual recreational leave is granted.

Inquiries and applications should be lodged with the Official Secretary, Office of the Agent-General for Tasmania, 457, Strand, London.

DONEGAL COUNTY COUNCIL. Applications are invited for the post of Temporary Part-time MEDICAL OFFICER to the District Hospital, Donegal town. Satisfactory experience and proficiency in major surgery is an essential qualification. Remuneration will be at the rate of £1100 p.a. inclusive, with no right to private beds or fees. The person appointed will be free to engage in consultative private practice outside of his hospital duties. In addition, the person appointed will be paid £400 p.a. inclusive, plus travelling expenses and subsistence at approved rates, for performing 2 surgical sessions per week at Lifford Hospital and being available for all emergencies there. The appointment will, subject to satisfactory service, be for a period of 6 months in the first instance, which may be continued.

Applications, giving full particulars of qualifications and experience, must be lodged with the Secretary, Donegal County Council, Lifford, on or before 21st May, 1958.

TRISTAN DA CUNHA. Doctor required for general medical duties on South Atlantic island of Tristan da Cunha. Knowledge of dentistry an asset. Appointment would be on agreement for approximately 2 years in first instance. Salary £1200 a year. Free quarters provided equipped with heavy furniture and refrigerator for which a small rental will be charged. Free return passages provided for officer, wife, and up to 3 children under 18 years of age. Generous home leave. Private practice is not permitted. Special importance will be attached to suitability of personal qualities for service in this small, remote, but distinctive community. Candidates must possess medical qualifications registrable in the United Kingdom.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting BCD.117/170/02).

WINDWARD ISLANDS. District Medical Officers re-quired for general hospital duties in Grenada and for district or hospital duties in Dominica. Appointment carries liability to serve in or transfer to any part of the Windward Islands. Candidates must possess qualifications registrable in United Kingdom. A limited number of R practitioners, i.e., practitioners liable for call-up under the National Service Acts, may apply and, if appointed, will be granted indefinite deferment of call-up on completion of a minimum tour of 2 years. Appointment on permanent basis with pension (non-contributory) or agreement for 3 years. Salary scale £800–£1000 p.a. Pension 1/600th of final pensionable emoluments for each completed month of service. Private practice if duties permit. Income-tax at local rates. Pay addition of 20% of basic salary also payable. Unfurnished quarters provided at rental not exceeding 10% of salary. Free passages on appointment for officer and family up to 5 persons in all. If appointed on agreement free return passages on completion of contract. Generous leave.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting BCD.117/41/01).

General Practice

For an ***Executive Council post*** *(England and Wales) apply on form* E.C.16A *obtainable from the council. Mark envelope "Vacancy."*

DALSTON, CARLISLE. Applications are invited for VACANCY (Rural) owing to resignation of practitioner at Dalston, near Carlisle. List at 1st April, 1958, 1673 (all dispensing patients). Residence and surgery may be available. Apply on Form E.C.16A by 30th May, 1958, to—

F. M. SMITH, Clerk to Cumberland Executive Council.
7, Chatsworth-square, Carlisle.

Experienced Practitioner seeks Partnership London or Southern England. Ample capital available for house purchase, &c.—Address, No. 398, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Miscellaneous

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Applications, giving details of qualifications, age, nationality, &c., may be addressed to Box E.584, WILLINGS, 362, Grays Inn-road, London, W.C.1.

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Applications, giving details of qualifications and experience and accompanied by the names of 3 persons to whom reference may be made, should be addressed to the Secretary of the Association at B.M.A. House, Tavistock-square, London, W.C.1, and must be received not later than 7th June.

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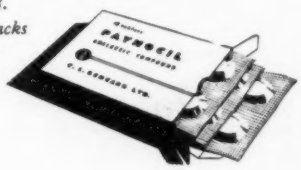

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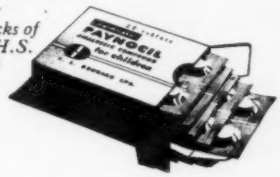

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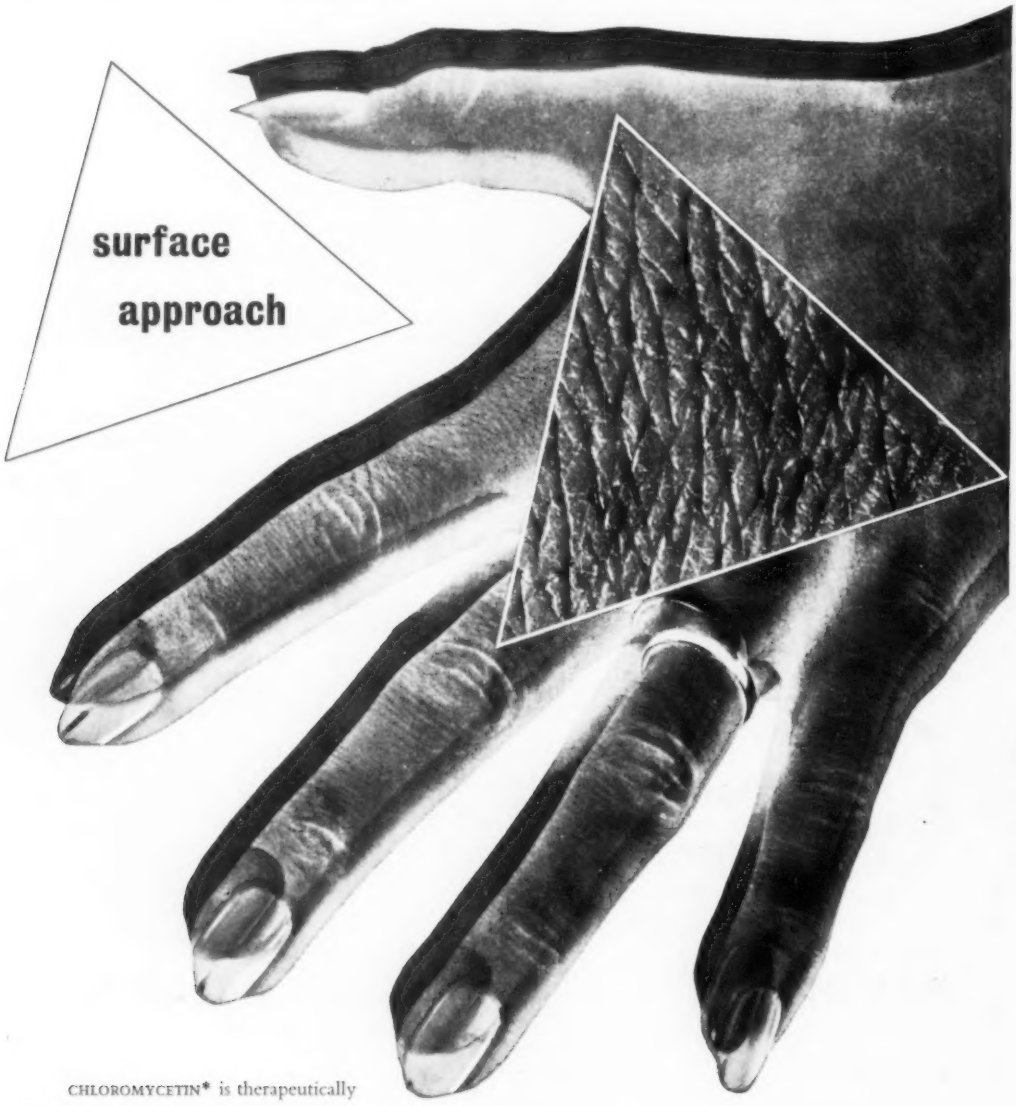

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